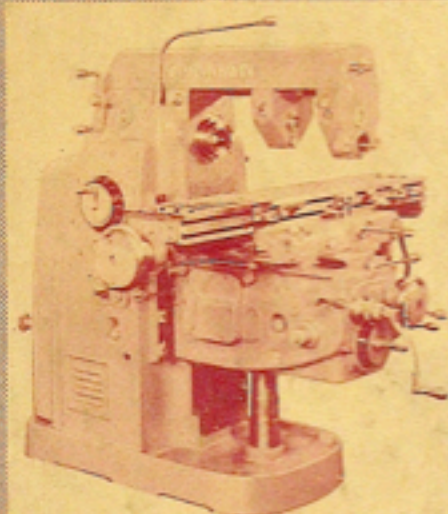


KEPT in Folder

FOLDER 566

*COR
MACHINE
566*

SERVICE MANUAL AND PARTS LIST CATALOG



**Nos. 2ML, 2MI and 3MI
MILLING MACHINES**



Identification No. 2J-LE
Publication No. M-2001

WHEN ORDERING REPAIR PARTS

1. Give complete Serial Number of Machine.
2. Give Part Number and Name.
3. Give Amount Required.

UNLESS THE ABOVE DATA IS INCLUDED WE CANNOT FILL YOUR ORDER

This Booklet should be Filed in Tool Crib and issued by Tool Check only

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

10/12/59
GA

SERIAL- NO 2J2P5H-11

MODEL-LL205-10-M1

OUR MACH- NO 556

KEPT IN FOLDER 60

SERVICE MANUAL

AND

PARTS LIST CATALOG

FOR

***Cincinnati* Nos. 2ML, 2MI and 3MI**

MILLING MACHINES

MODEL LL



This catalog was prepared for two primary reasons. First, to expedite the ordering of repair parts for your CINCINNATI Nos. 2ML, 2MI and 3MI Milling Machines; secondly, to present to maintenance personnel the correct method of servicing these machines.

Due to continual improvements in design, it is possible that some information or the appearance of component parts to be found in this catalog may vary slightly from the machine delivered to you. This merely indicates that the mechanism has been improved to better fulfill your requirements.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

**THIS CATALOG TO BE USED ONLY FOR MACHINES WHOSE
SERIAL NUMBERS BEGIN WITH 2J AND 5J**

INDEX

SERVICE MANUAL

1. ADJUSTMENTS	Page
To adjust Arbor Support Bushings	21
" " Backlash Eliminator	20
" " Cross Screw Bearings	19
" " Driving Clutch	18
" " Dynapoise Overarm	21
" " Gibs	18
" " Hydraulic Oil Pressure	21
" " Main Drive Belts	19
" " Spindle Bearings	21
" " Table Lead Screw Bearings	18
2. CONVERSION CHART (Inches into Millimeters)	13
3. DIAGRAMS AND ILLUSTRATIONS	
Dimensional Drawings	5, 7, 9, 11
Functional Diagrams	4, 6, 8, 10
Lubrication Diagrams	14, 16
4. DISMANTLING INSTRUCTIONS	
To Remove and Dismantle Feed Drive Bracket	25
" " " Main Drive Bracket	24
" " " Power Feed to Vertical Head (Vertical Machines)	33
" " " Shifter Bracket	23
" " " Vertical Head	33
To Change Feed Range from 1/4-30 to 1/2-60	26
To Remove Cross Screw From Knee	26
" " Cross Screw Clutch and Gears	31
" " Feed Dial Assembly from Knee	27
" " Front Elevating Shaft	26
" " Knee (for partial or complete dismantling)	29
" " Knee Drive Motor and Mounting Bracket	28
" " Knee with Table (for replacement of rapid traverse clutch)	28
" " Rapid Traverse Clutch and Gears	29
" " Saddle from Knee	28
" " Safety Clutch and Shaft	30
" " Spiral Bevel Gear and Pinion (Vertical Machines)	33
" " Table and Lead Screw	27
" " Universal Housing from Saddle	28
" " Vertical and Cross Feed Control Shafts	30
" " 5th Drive Shaft (Horizontal Machines)	32
" " 5th Drive Shaft (Vertical Machines)	33
" " 6th Drive Shaft (Spindle)	32

INDEX (Continued)

	Page
5. INSTALLATION INSTRUCTIONS	17
6. LUBRICATION INSTRUCTIONS AND SPECIFICATIONS	15, 16
7. MAINTENANCE HINTS	
Faulty Operation of Main Clutch and Spindle Brake	36
Knee Movement Does Not Coincide with Dial Movement	36
Knee Drops from Dial Setting after it has been Moved Up or Down	36
Low Hydraulic Oil Pressure	35
Power Cross or Vertical Feed Levers Hang Up Before Clutch is Engaged with Resultant Clashing of Gears	36
Rapid Traverse Levers do not Return to Neutral Position When Released	36
Rapid Traverse Table Movements Erratic	36
Speed Gears Fail to Shift	35
Speed Variation from Actual Dial Setting	35
Table Feed Does Not Agree with Dial Setting.	36

PARTS LIST

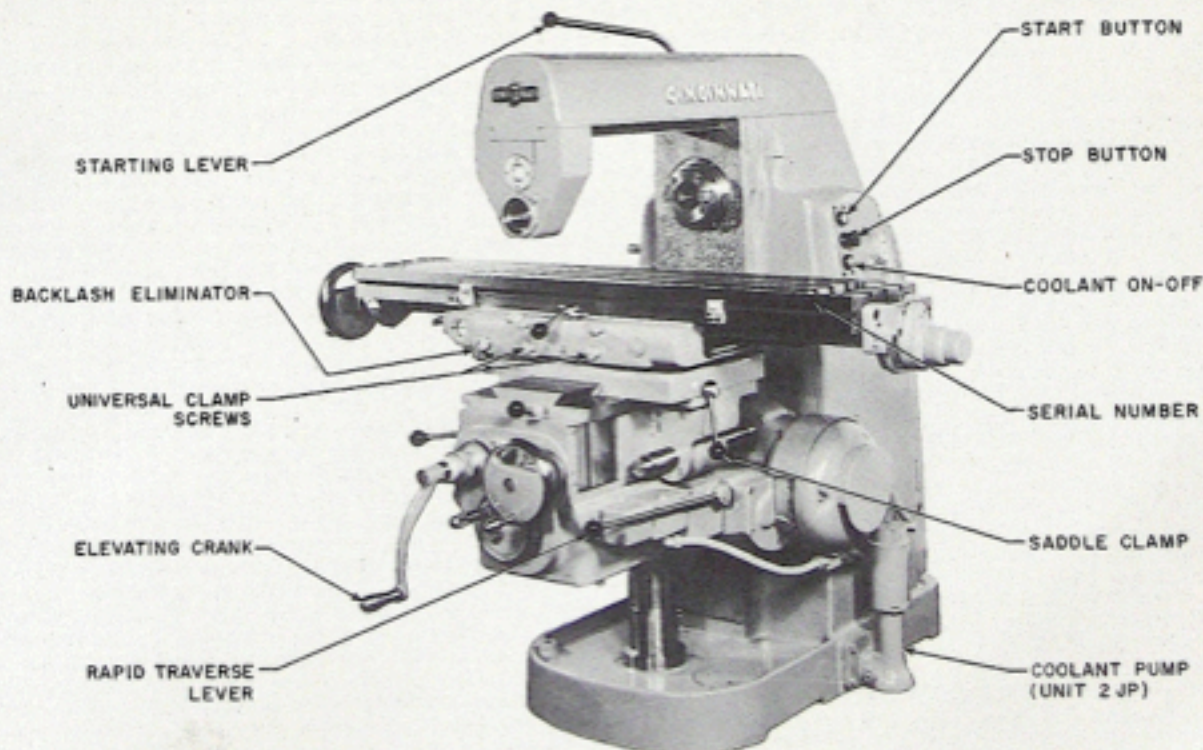
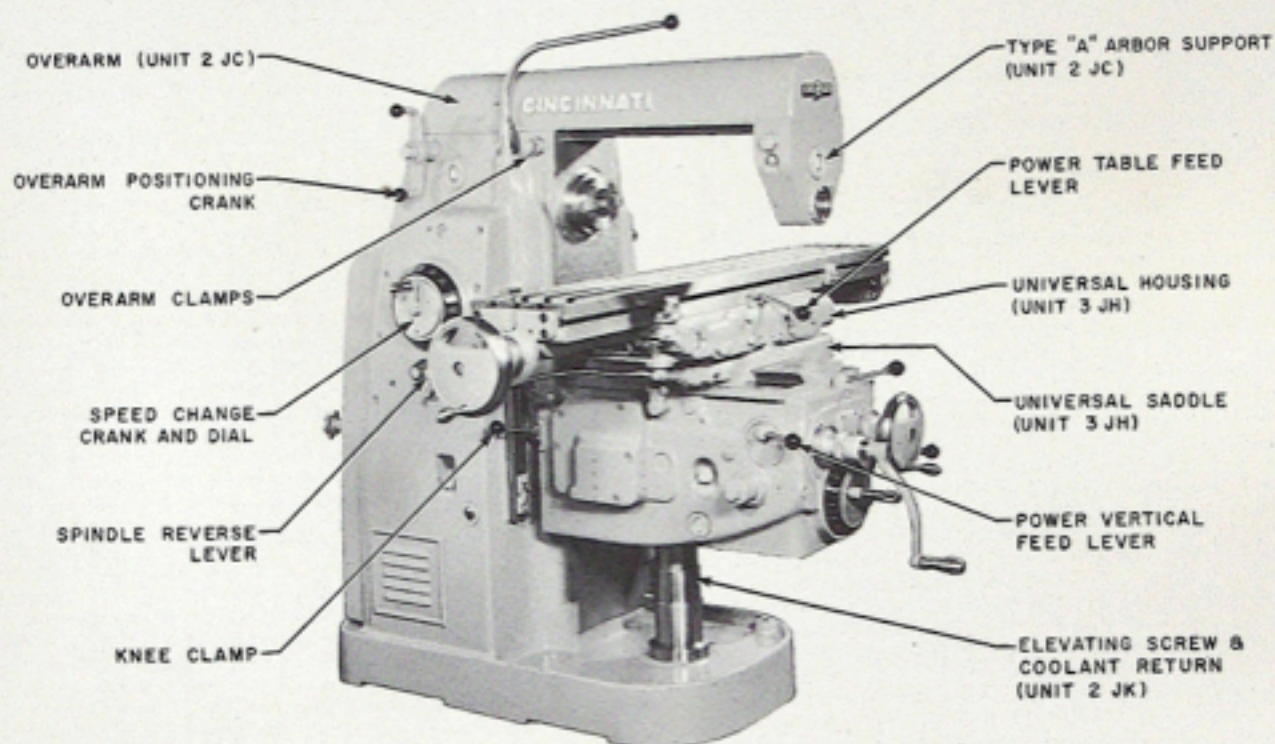
8. HOW TO ORDER REPAIR PARTS	39
9. COLUMN (Unit No. 2JC)	110-131
10. COOLANT PUMP AND PIPING (Unit No. 2JP)	148-151
11. DRIVE BRACKET (Unit No. 2JBM)	106-109
12. FEED BOX (Unit No. 2JF)	46-47
13. GEAR SHIFTER BRACKET (Unit No. 2JS)	40-45
14. HAND AND POWER FEED TO VERTICAL HEAD (Unit No. 2JAJ)	132-139
15. KNEE (Unit No. 2JK)	48-75
16. MACHINE INSTRUCTION AND NAME PLATES	152-153
17. MOTOR DRIVE (Unit No. 2JN)	104-105
18. SADDLE TABLE (Unit No. 2JH)	76-103
19. TURRET STOP (Unit No. 2JAR)	140-141
20. VERTICAL HEAD (Unit No. 2JDV)	142-147

NOTE: As a reference aid, figure numbers are the same as the page numbers on which they appear. As an example Figures 18 A and 18 B appear on page 18.

PATENT NOTICE: These machines and attachments are manufactured and protected by issued and pending United States and Foreign Patents.

The design and specifications of these machines and attachments illustrated and described herein are subject to change without notice.

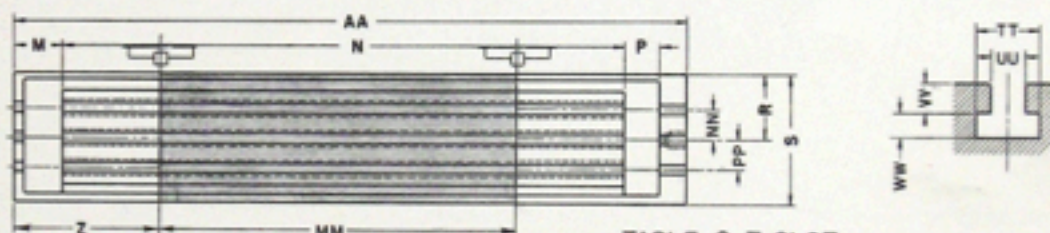
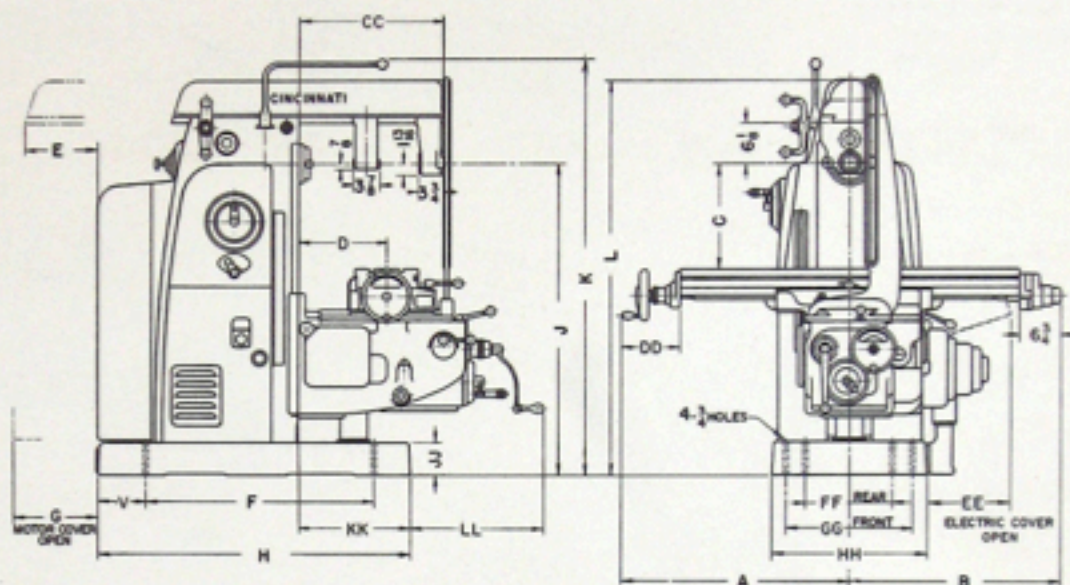
FUNCTIONAL DIAGRAM



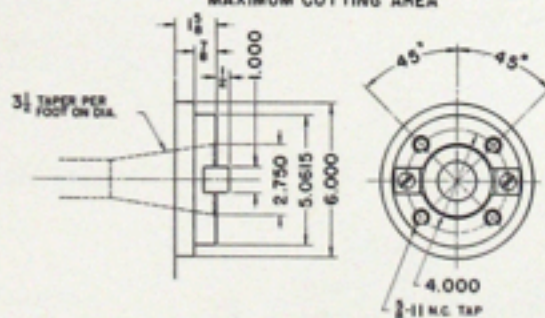
FIGURES 4A and 4B
No. 2MI Universal Machine

DIMENSIONAL DRAWING

Nos. 2ML and 2MI Universal

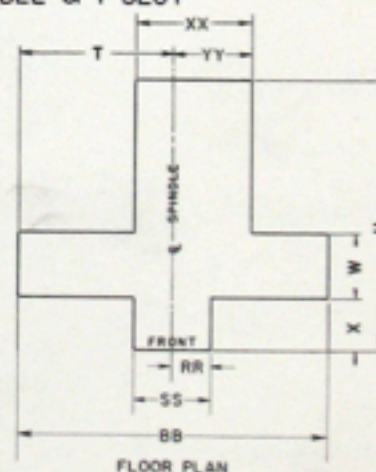


SHADED SURFACE INDICATES
MAXIMUM CUTTING AREA



SPINDLE NOSE
STANDARD FLANGED END
WITH NO. 50 SERIES TAPER

TABLE & T-SLOT

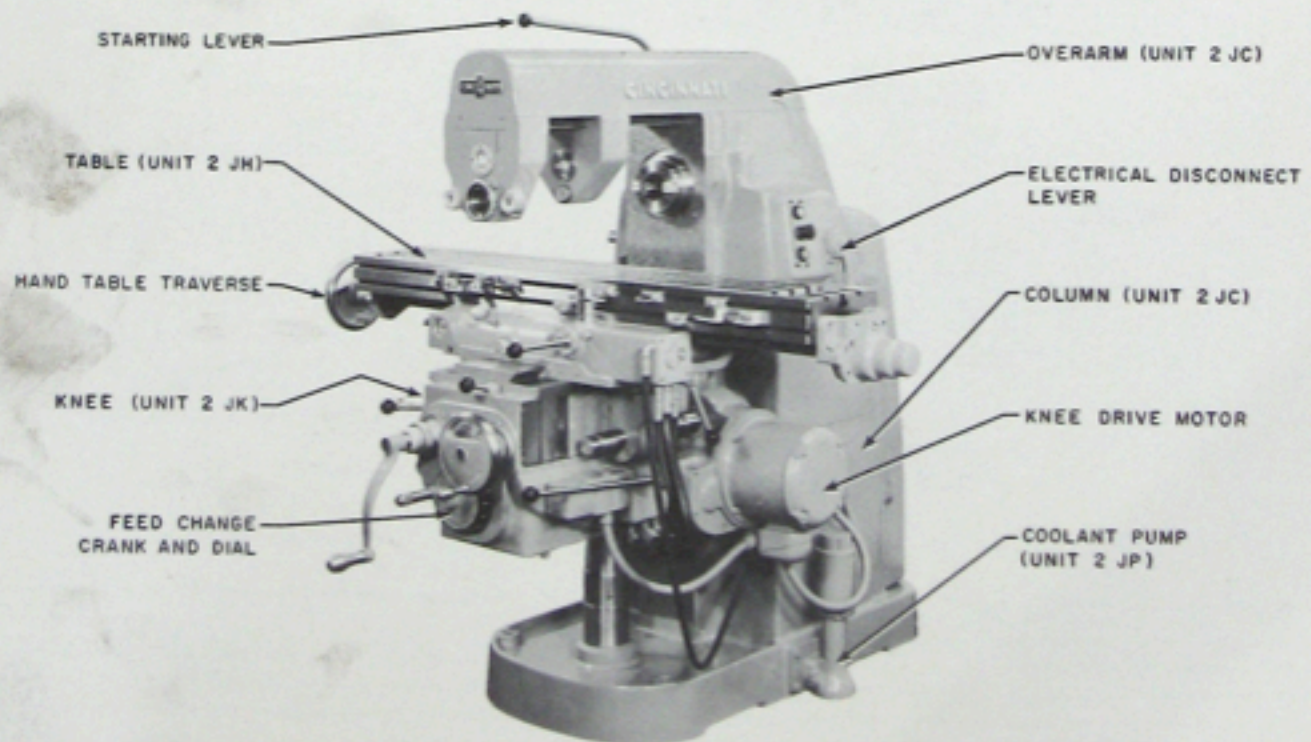
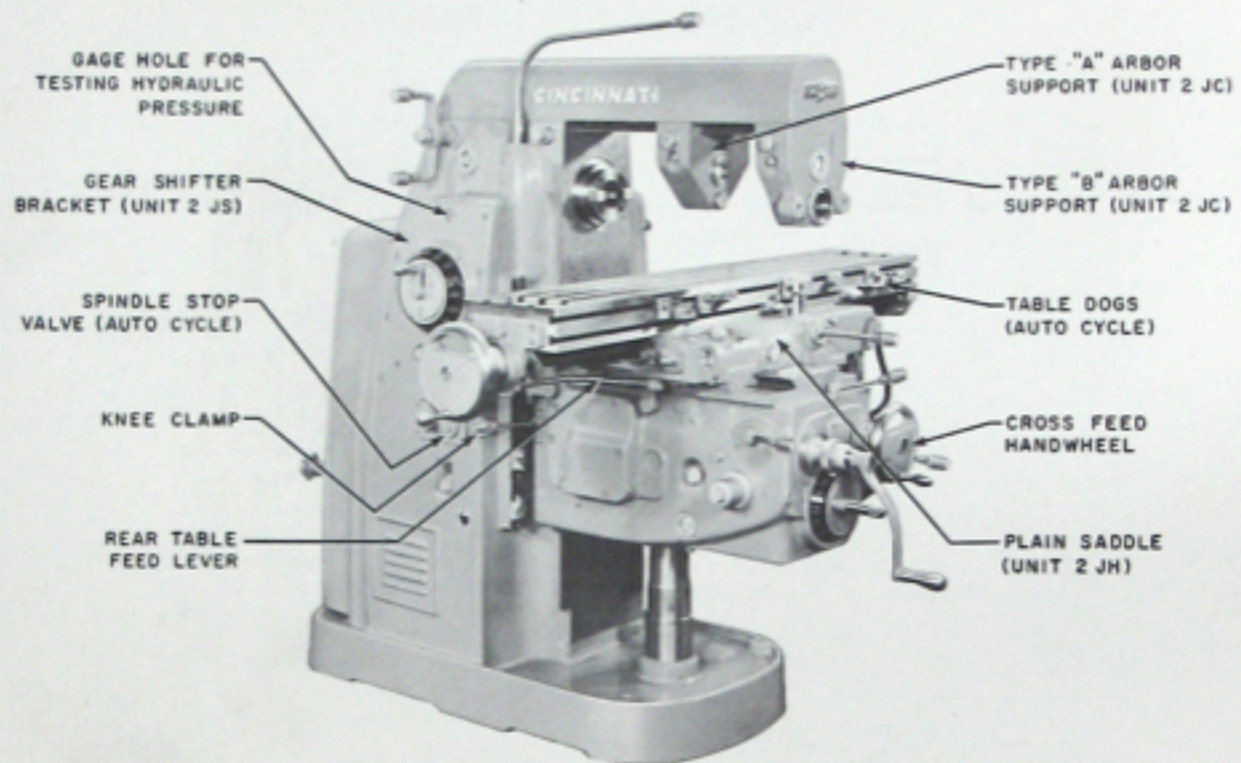


FLOOR PLAN

SIZE	A		B		C		D			E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Z
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	W/OUT BRACE	WITH BRACE	MIN.																		
2ML	30-6/16	22-9/16	47-15/16	39-15/16	18	0	17-9/16	13-5/8	7-9/16	16-1/2	33-3/4	16-1/4	63-1/8	66-1/4	42-5/8	39-3/8	3-3/4	45-9/16	2-3/4	4-13/16	9-11/16	30-13/16	41-5/16	4-3/8	39-1/2	16-3/16	13-1/4
2MI	30-6/16	22-9/16	47-15/16	39-15/16	18	0	17-9/16	13-5/8	7-9/16	16-1/2	33-3/4	16-1/4	63-1/8	66-1/4	42-5/8	39-3/8	3-3/4	45-9/16	2-3/4	5	10	30-13/16	41-5/16	4-3/8	39-1/2	16-3/16	13-1/4

SIZE	AA	BB	CC		DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	RR	SS	TT	UU	VV	WW	XX	YY
			W/OUT BRACE	W/OUT BRACE																			
2ML	34-7/16	26-3/8	22-11/16	22	9-5/16	14-1/2	13-1/2	19-1/2	24	5-1/8	17-1/2	10-1/16	38	2-5/16	2-5/16	11	22	1-1/4	11/16	3/4	21/64	26-1/2	26-1/2
2MI	34-7/16	26-3/8	22-11/16	22	9-5/16	14-1/2	13-1/2	19-1/2	24	5-1/8	17-1/2	10-1/16	38	2-5/16	2-5/16	11	22	1-1/4	11/16	3/4	21/64	26-1/2	26-1/2

FUNCTIONAL DIAGRAM



FIGURES 6A and 6B
No. 2MI Plain Machine

DIMENSIONAL DRAWING

Nos. 2ML and 2MI-Plain

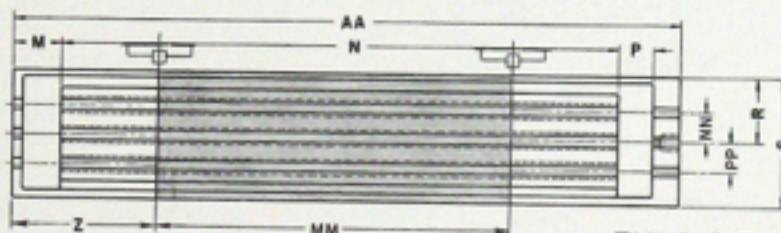
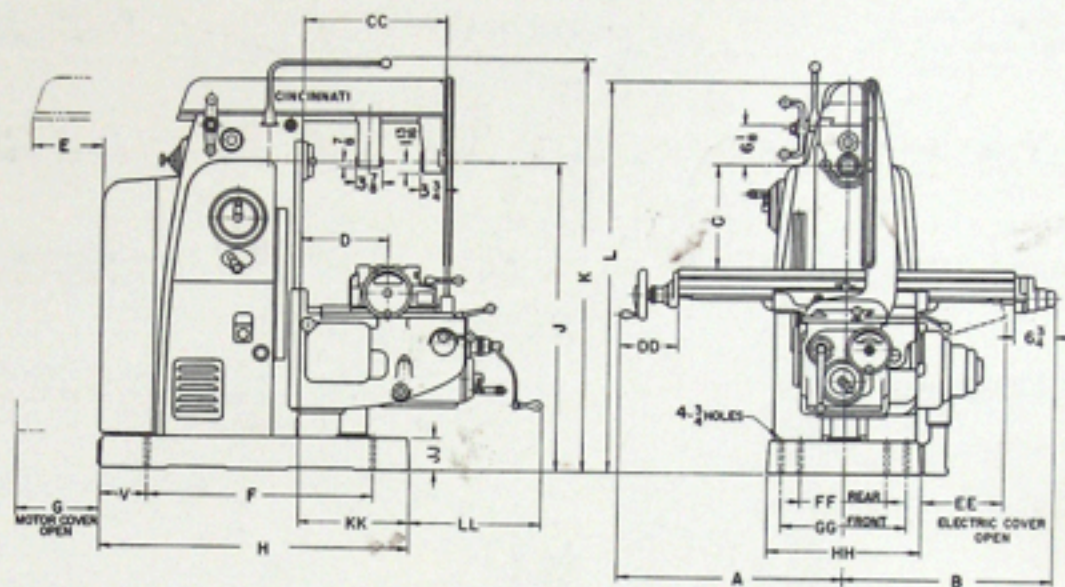
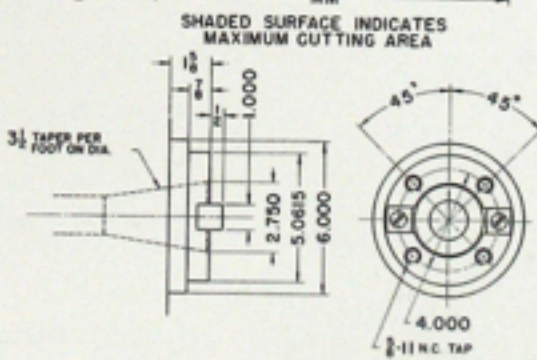
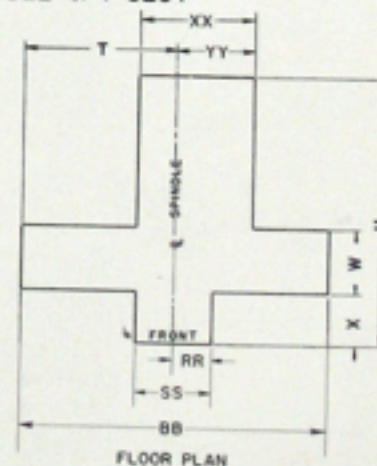


TABLE & T-SLOT



SPINDLE NOSE
STANDARD FLANGED END
WITH NO. 50 SERIES TAPER

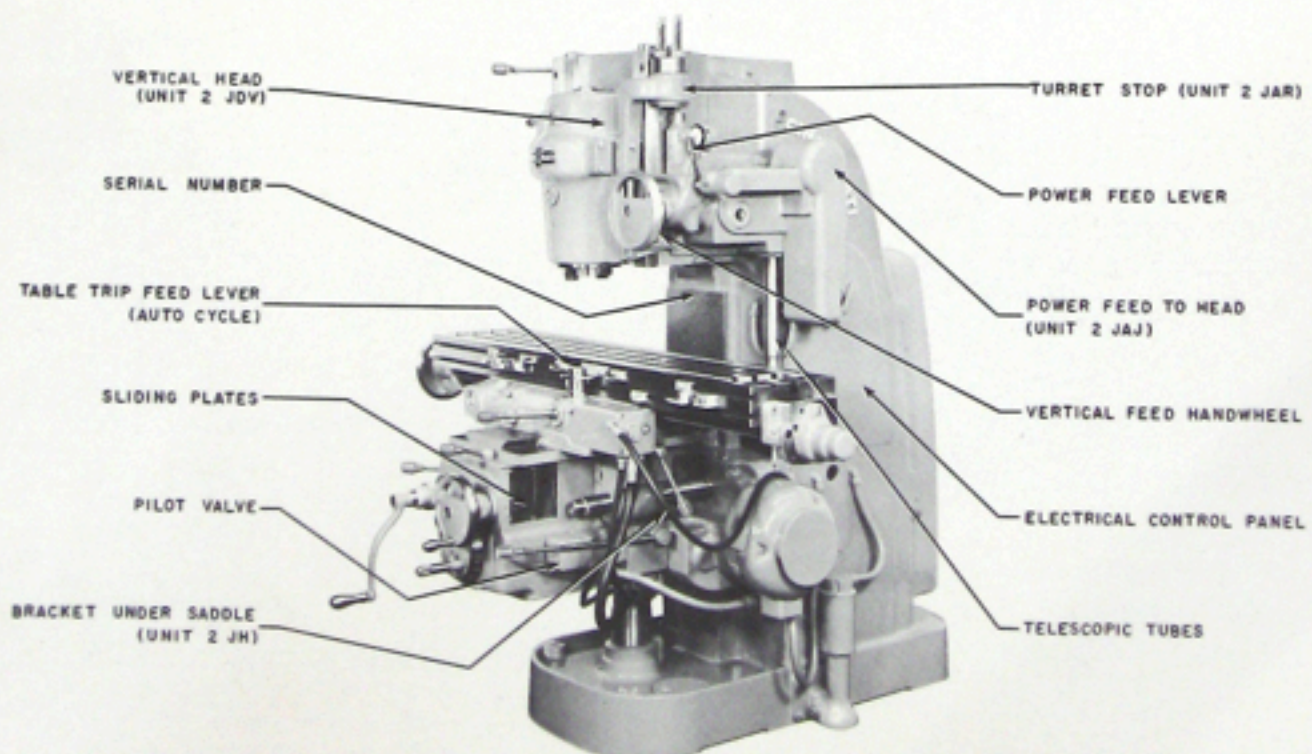
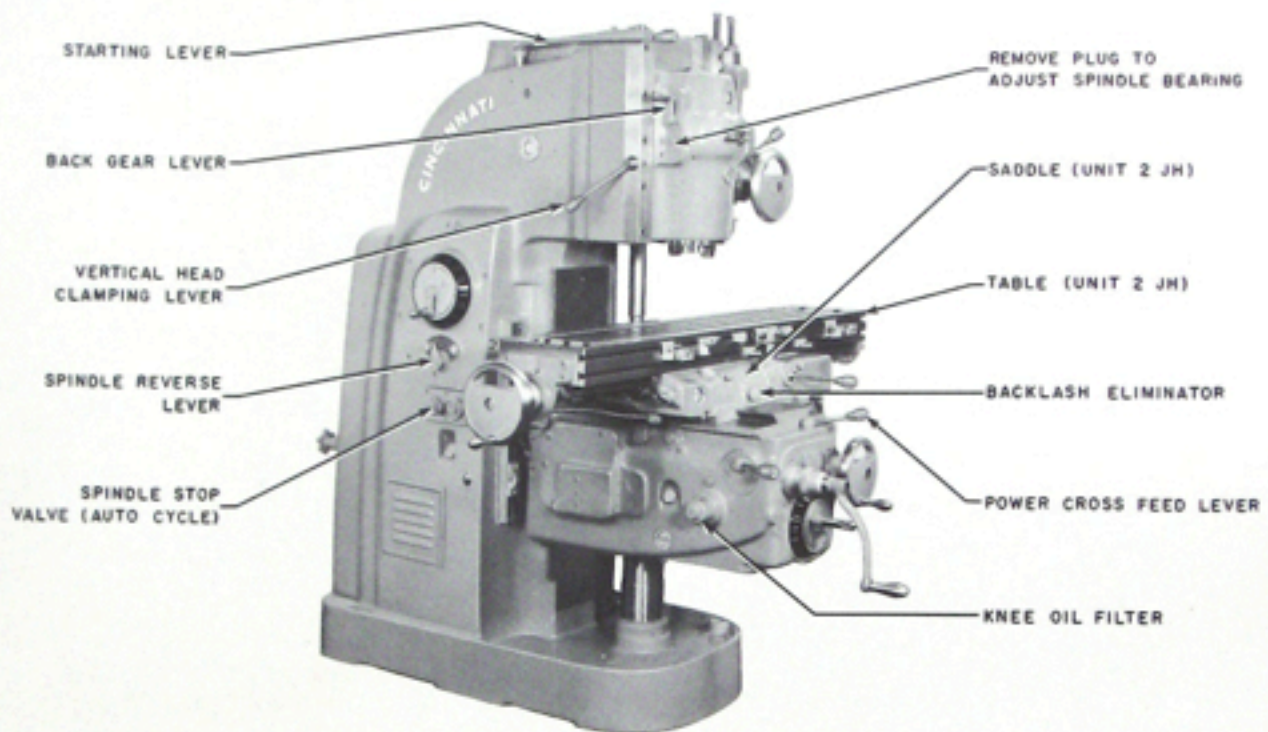


FLOOR PLAN

SIZE	A		B		C		D			E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	W/O/T BRACE	WITH BRACE	MIN.																		
2ML	49-1/16	21-5/16	49-7/16	21-7/16	16-1/2	0	17-8/16	13-5/8	7-8/16	16-1/2	33-3/4	16-1/4	43-5/8	46-1/4	42-5/8	38-3/4	2-3/4	43-9/16	2-3/4	4-11/16	8-11/16	49-5/16	81-3/16	6-3/8	18-11/16	16-5/16	11-3/4
2MI	49-1/16	21-1/16	49-7/16	21-7/16	16-1/2	0	17-8/16	13-5/8	7-8/16	16-1/2	33-3/4	16-1/4	43-5/8	46-1/4	42-5/8	38-3/4	2-3/4	43-9/16	2-3/4	4-11/16	8-11/16	49-5/16	81-3/16	6-3/8	18-11/16	16-5/16	11-3/4

SIZE	AA	BB	CC		DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO	PP	RR	SS	TT	UU	VV	WW	XX	YY
			WITH BRACE	W/O/T BRACE																					
2ML	54-7/16	99	22-11/16	25	9-5/16	34-1/2	13-1/2	19-1/2	24	5-1/4	17-1/2	21-1/16	26	2-5/16	2-5/16	11	22	1-1/4	11/16	3/4	31/64	39-1/2	36-1/2		
2MI	54-7/16	99	22-11/16	25	9-5/16	34-1/2	13-1/2	19-1/2	24	5-1/4	17-1/2	21-1/16	26	2-5/16	2-5/16	11	22	1-1/4	11/16	3/4	31/64	39-1/2	36-1/2		

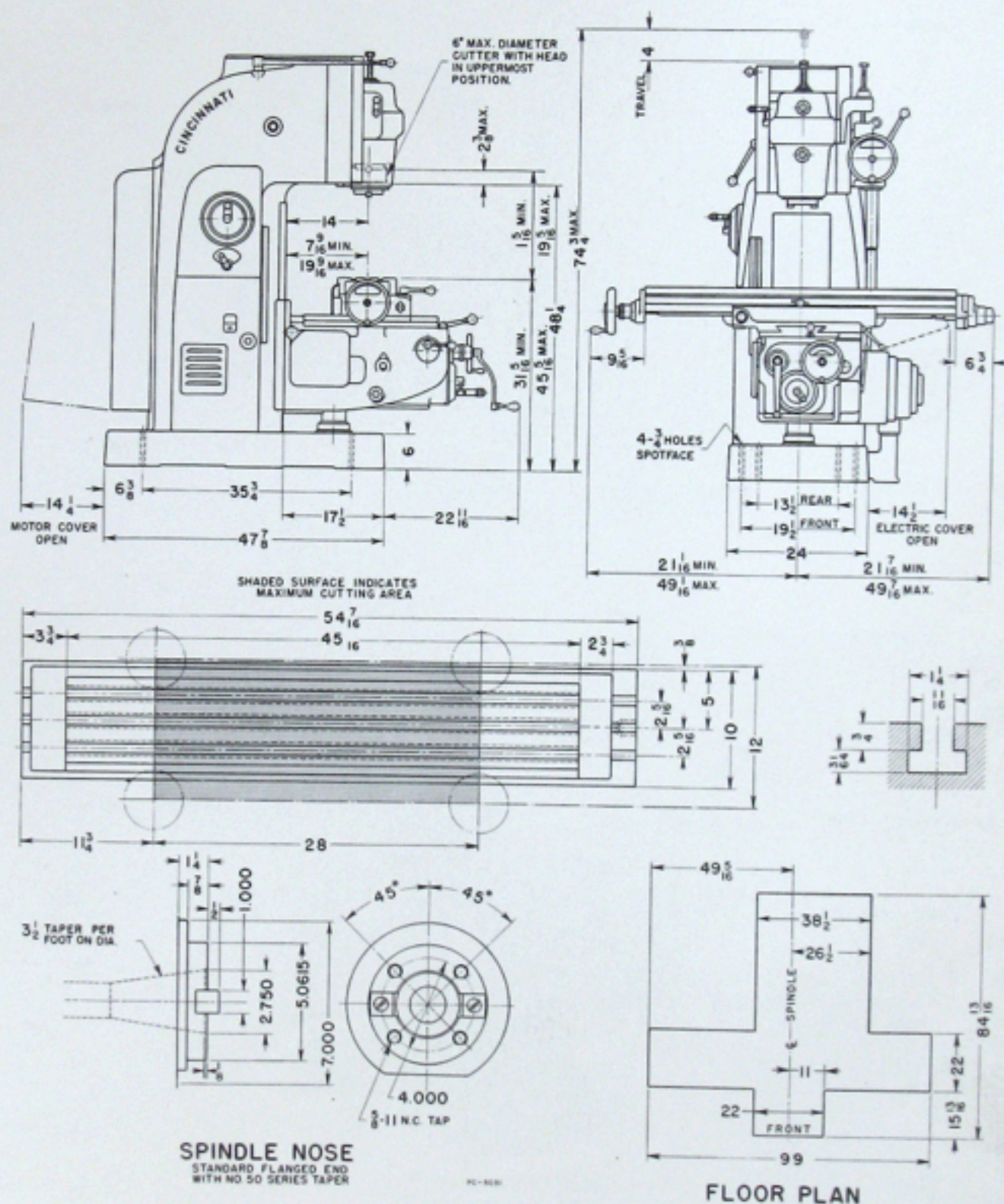
FUNCTIONAL DIAGRAM



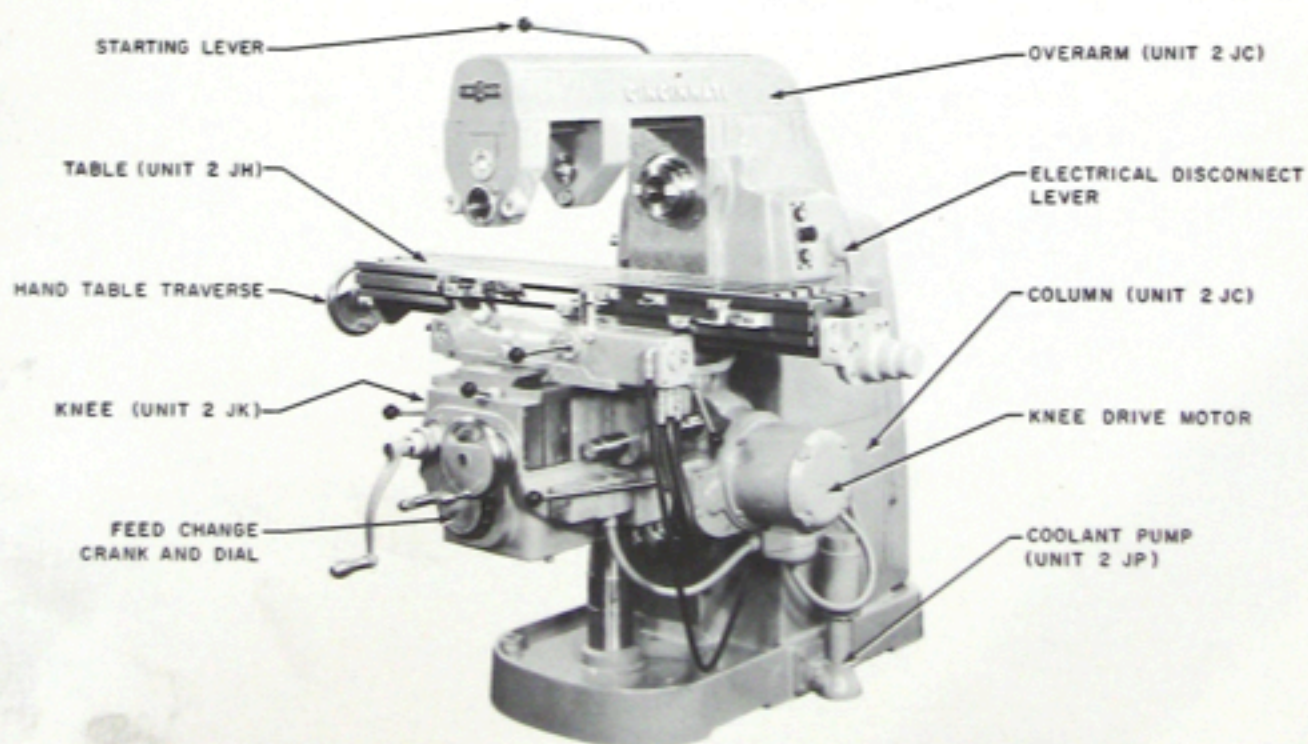
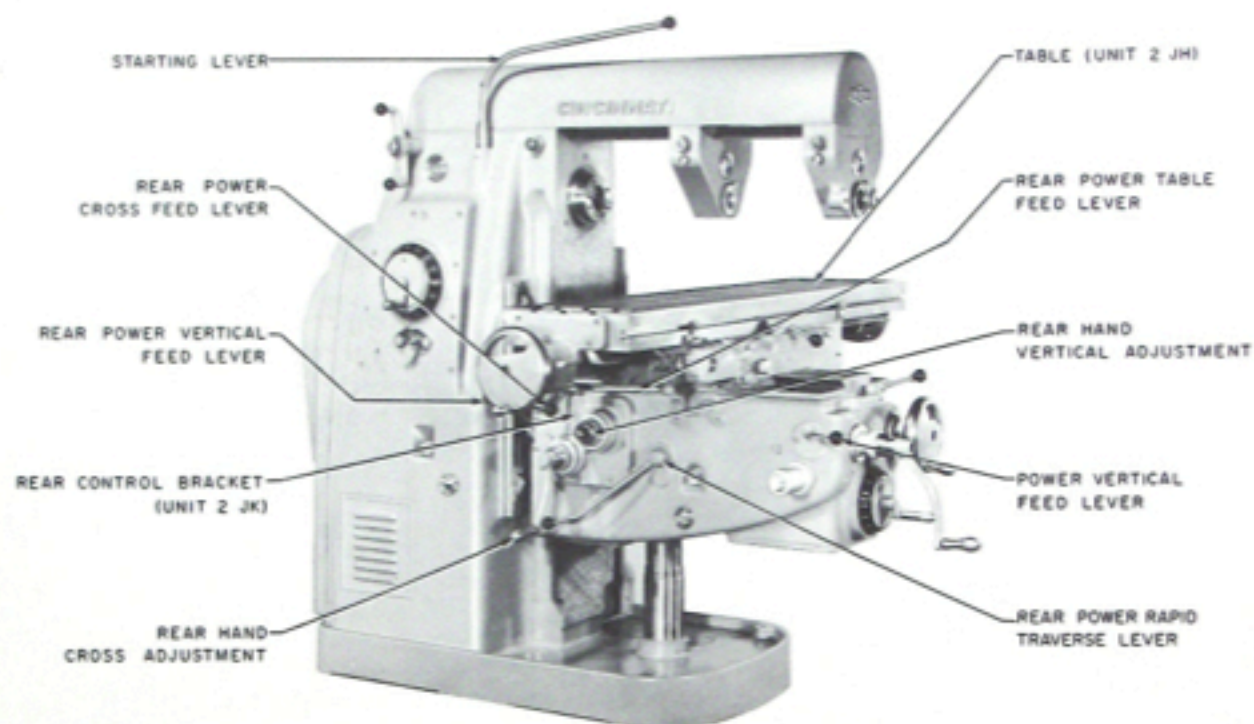
FIGURES 8A and 8B
No. 2MI Vertical Machine

DIMENSIONAL DRAWING

No. 2MI Vertical



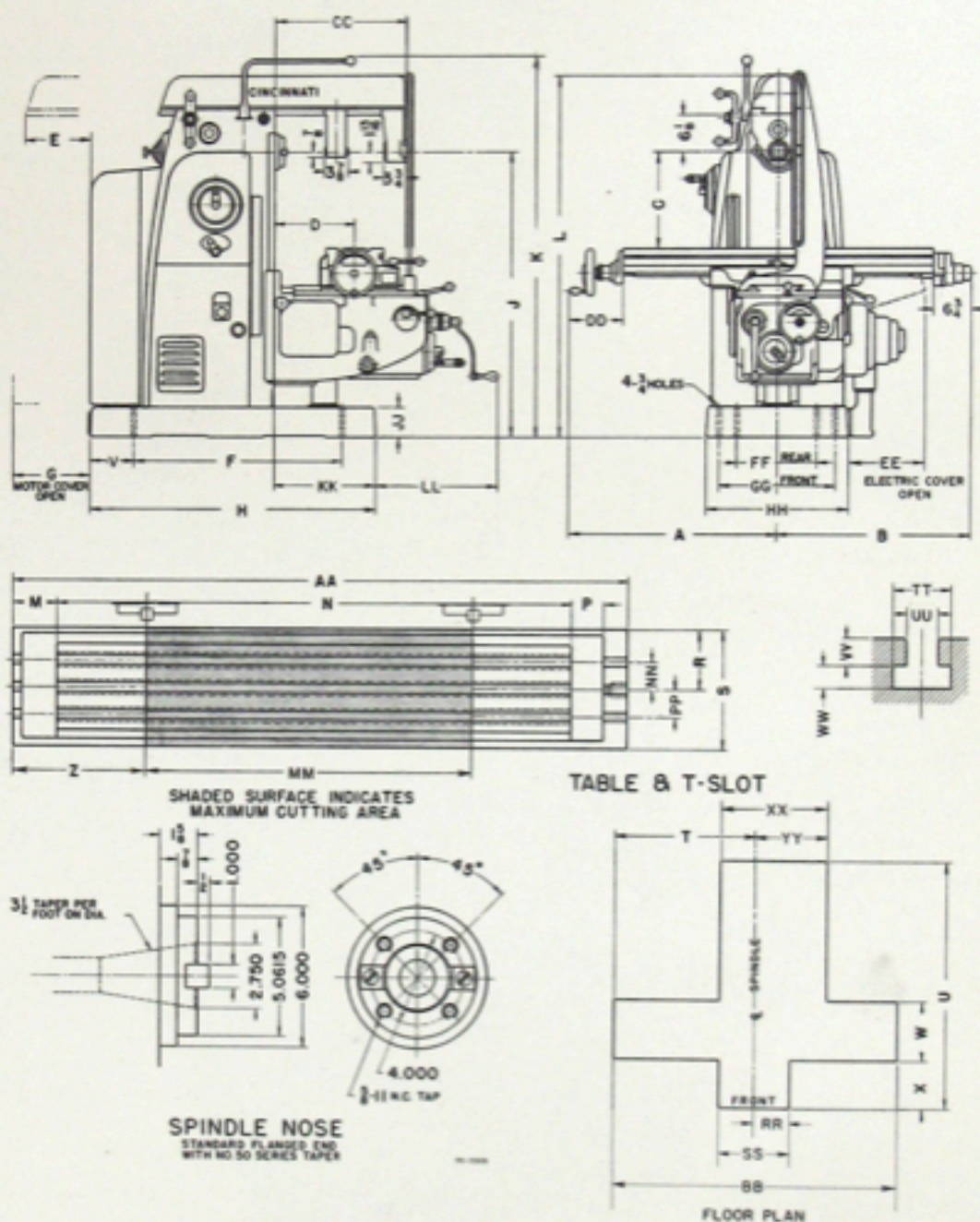
FUNCTIONAL DIAGRAM



FIGURES 10A and 10B
No. 3 MI Plain Machine

DIMENSIONAL DRAWING

No. 3MI Plain and Universal



SIZE	A		B		C		D		E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Z
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	W/OUT BRACE	WITH BRACE																			
Plain	57-1/16	23-1/16	56-1/8	24-1/8	20	0	21-5/8	20	9-1/8	18-1/8	43-1/2	17-1/2	56-1/2	10-1/2	70-3/4	45-1/8	3-3/4	34	2-3/4	1	14	57-5/16	100-5/16	6-5/8	28	18-1/16	11-1/8
Univ.	56-3/16	24-3/16	57	23	19	0	21-5/8	21	9-7/8	18-1/8	43-1/2	17-1/2	56-1/2	10-1/2	70-3/4	45-7/8	3-3/4	34	2-3/4	1	14	56-7/16	100-5/16	6-5/8	28	18-1/16	12-3/16

SIZE	AA	BB	CC		DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	RR	SS	TT	UU	VV	WW	XX	YY
			WITH BRACE	W/OUT BRACE																			
Plain	43-1/2	115-5/16	30-13/16	22-3/8	11-15/16	16-1/4	16	34	28-1/2	5	22	24-11/16	34	3-1/4	3-1/4	13	24	1-15/32	13/16	7/8	5/8	51	31
Univ.	43-1/2	115-5/16	30-13/16	22-3/8	11-15/16	16-1/4	16	34	28-1/2	5	22	24-11/16	34	3-1/4	3-1/4	13	24	1-15/32	13/16	7/8	5/8	51	31

FUNCTIONAL DIAGRAM

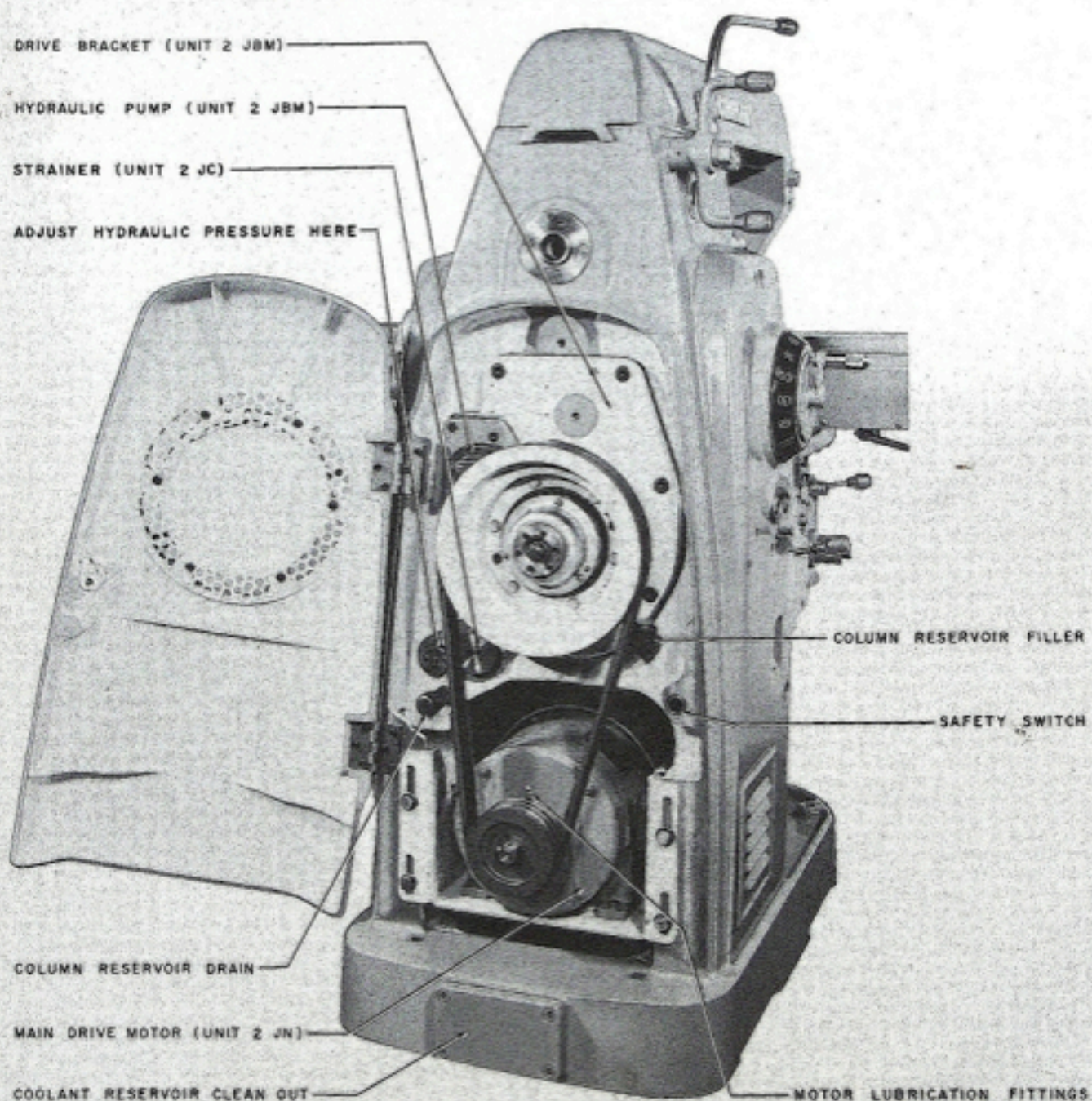


FIGURE 12

CONVERSION CHART

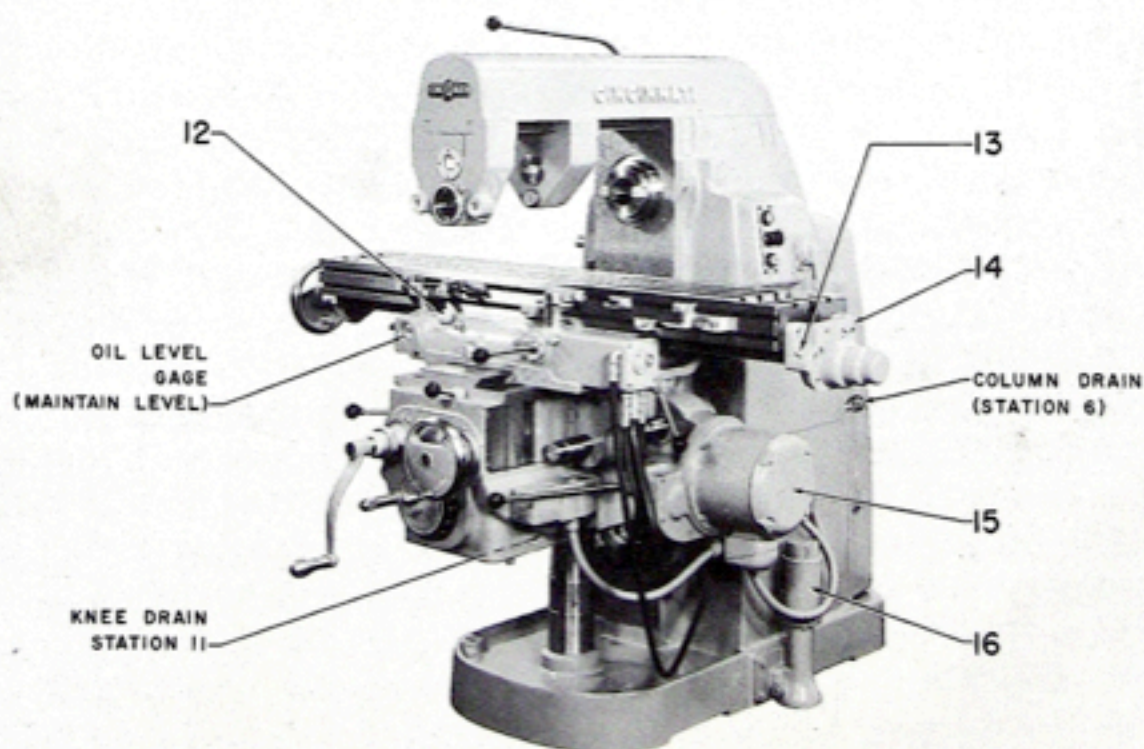
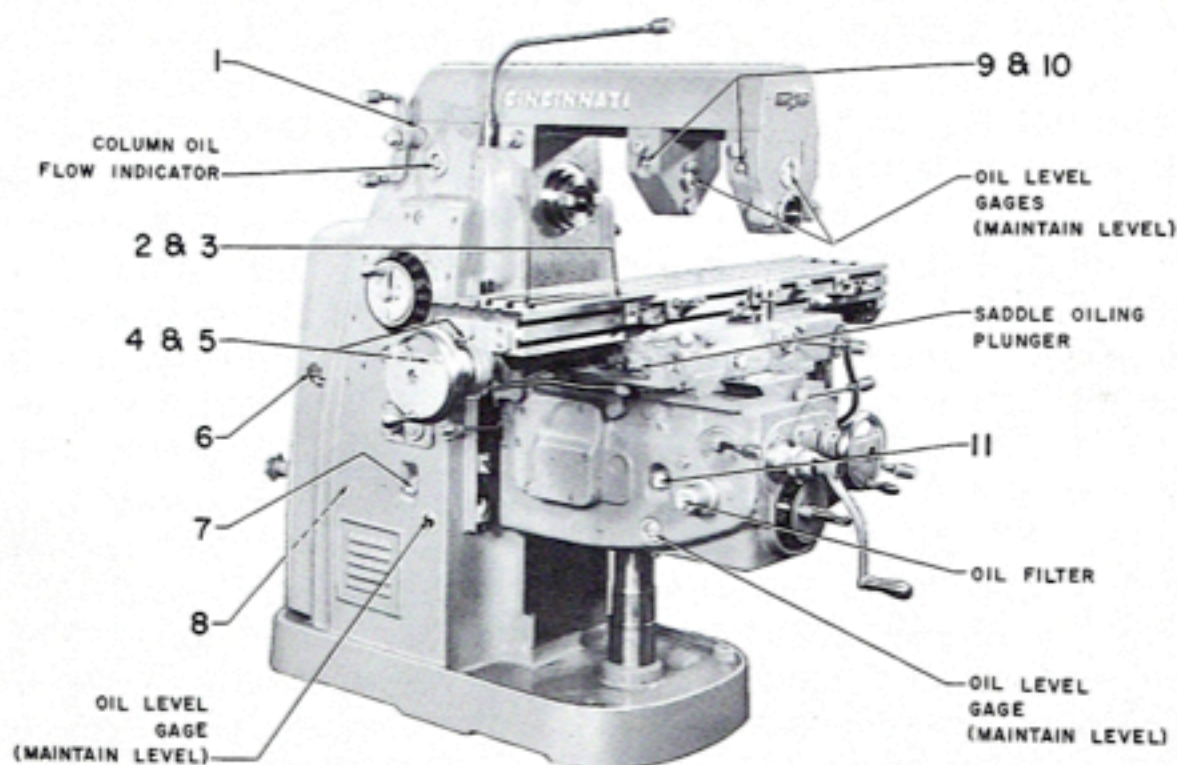
(Based on 25.4mm = 1")

Inches into Millimeters

Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M
1/64	.0156	0.3969	49/64	.7656	19.4469	34	863.600	82	2082.80
1/32	.0313	0.7937	25/32	.7813	19.8437	35	889.000	83	2108.20
3/64	.0469	1.1906	51/64	.7969	20.2406	36	914.400	84	2133.60
1/16	.0625	1.5875	13/16	.8125	20.6375	37	939.800	85	2159.00
5/64	.0781	1.9844	53/64	.8281	21.0344	38	965.200	86	2184.40
3/32	.0938	2.3812	27/32	.8438	21.4312	39	990.600	87	2209.80
7/64	.1094	2.7781	55/64	.8594	21.8281	40	1016.00	88	2235.20
1/8	.1250	3.1750	7/8	.8750	22.2250	41	1041.40	89	2260.60
9/64	.1406	3.5719	57/64	.8906	22.6219	42	1066.80	90	2286.00
5/32	.1563	3.9687	29/32	.9063	23.0187	43	1092.20	91	2311.40
11/64	.1719	4.3656	59/64	.9219	23.4156	44	1117.60	92	2336.80
3/16	.1875	4.7625	15/16	.9375	23.8125	45	1143.00	93	2362.20
13/64	.2031	5.1594	61/64	.9531	24.2094	46	1168.40	94	2387.60
7/32	.2188	5.5562	31/32	.9688	24.6062	47	1193.80	95	2413.00
15/64	.2344	5.9531	63/64	.9844	25.0031	48	1219.20	96	2438.40
1/4	.2500	6.3500	1		25.4000	49	1244.60	97	2463.80
17/64	.2656	6.7469	2		50.800	50	1270.00	98	2489.20
9/32	.2813	7.1437	3		76.200	51	1295.40	99	2514.60
19/64	.2969	7.5406	4		101.600	52	1320.80	100	2540.00
5/16	.3125	7.9375	5		127.000	53	1346.20	101	2565.40
21/64	.3281	8.3344	6		152.400	54	1371.60	102	2590.80
11/32	.3438	8.7312	7		177.800	55	1397.00	103	2616.20
23/64	.3594	9.1281	8		203.200	56	1422.00	104	2641.60
3/8	.3750	9.5250	9		228.600	57	1447.80	105	2667.00
25/64	.3906	9.9219	10		254.000	58	1473.20	106	2692.40
13/32	.4063	10.3187	11		279.400	59	1498.60	107	2717.80
27/64	.4219	10.7156	12		304.800	60	1524.00	108	2743.20
7/16	.4375	11.1125	13		330.200	61	1549.40	109	2768.60
29/64	.4531	11.5094	14		355.600	62	1574.80	110	2794.00
15/32	.4688	11.9062	15		381.000	63	1600.20	111	2819.40
31/64	.4844	12.3031	16		406.400	64	1625.60	112	2844.80
1/2	.5000	12.7000	17		431.800	65	1651.00	113	2870.20
33/64	.5156	13.0969	18		457.200	66	1676.40	114	2895.60
17/32	.5313	13.4937	19		482.600	67	1701.80	115	2921.00
35/64	.5469	13.8906	20		508.000	68	1727.20	116	2946.40
9/16	.5625	14.2875	21		533.400	69	1752.60	117	2971.80
37/64	.5781	14.6844	22		558.800	70	1778.00	118	2997.20
19/32	.5938	15.0812	23		584.200	71	1803.40	119	3022.60
39/64	.6094	15.4781	24		609.600	72	1828.80	120	3048.00
5/8	.6250	15.8750	25		635.000	73	1854.20	121	3073.40
41/64	.6406	16.2719	26		660.400	74	1879.60	122	3098.80
21/32	.6563	16.6687	27		685.800	75	1905.00	123	3124.20
43/64	.6719	17.0656	28		711.200	76	1930.40	124	3149.60
11/16	.6875	17.4625	29		736.600	77	1955.80	125	3175.00
45/64	.7031	17.8594	30		762.000	78	1981.20	126	3200.40
23/32	.7188	18.2562	31		787.400	79	2006.60	127	3225.80
47/64	.7344	18.6531	32		812.800	80	2032.00	128	3251.20
3/4	.7500	19.0500	33		838.200	81	2057.40	129	3276.60

0.001" = .0254 mm

0.01 mm = 0.0004"



FIGURES 14A and 14B
Lubrication Diagrams

LUBRICATION INSTRUCTIONS AND SPECIFICATIONS

(See Lubrication Diagrams, Opposite Page)

Thoroughly oil all moving parts as they are installed. Then lubricate all principal points as listed below before starting motor. Periodic and thorough lubrication with correct lubricant, as specified,

will help maintain the long life and accuracy built into machine. The intervals listed are based on a normal eight-hour day.

PURCHASE LUBRICANTS FROM RELIABLE DEALERS

Interval	Station No. and Part Lubricated	Lubricating Instructions		Lubricant Specifications
Daily (8 Hours)	1—Overarm pilot wheel bearing	Fill oil cups.		CMMCo.— No. P-55 Rust and oxidation inhibited mineral oil. Viscosity 200 to 220 SSU at 100° F.
	2, 3—Knee-Column ways			
	4, 14—Leadscrew bearings			
	11—Gears and bearings in knee	Cap. * Drain at 6 months	Check oil level daily. Fill to high limit when oil drops to low limit.	
	6—Column gears and bearings	Cap. 2-1/2 gal. Drain at 6 months	Check oil level daily. Fill to high limit when oil drops to low limit.	
	9, 10—Arbor support bearings	Cap. 1-1/2 gal. Drain at 6	Check oil level daily. Fill to high limit when oil drops to low limit.	
	12—Saddle parts and knee- saddle ways.	Cap. Approx. 1/3 qt.	Maintain oil level be- tween high and low limits on gage.	
		TWICE DAILY pull out plunger at left 3 times and allow to return by itself each time.		
	5, 14—Long lead drive shaft bushings.	Fill oil cups. (Only when long drive mechanism is used).		
7—Vertical screw	Cap. 1 quart	Check oil level daily. Fill to high limit when oil drops to low limit.	CMMCo.— No. P-53 Hydraulic - Slideway oil. Viscosity 155 to 165 SSU at 100° F. (Oil must pass our slipstick test).	
Periodically	15—Knee drive motor bearings	See note below.		
	8—Main drive motor bearings			
	16—Coolant pump bearings			

In above oiling interval use daily or 8 hours, monthly or 160 hours, 6 months or 1000 working hours; whichever comes first when machine is operated continuously.

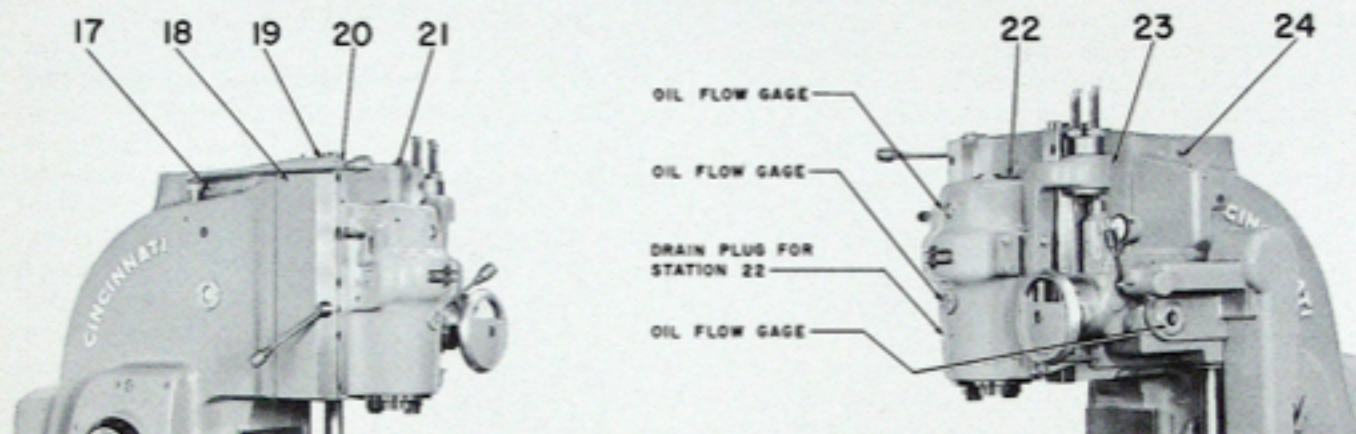
*Drain knee and column at end of first month and every six months thereafter. Cap. 2MI, 2ML: 1-1/2 gal.; 3MI: 2-1/2 gal.

Column oil strainer should be cleaned at least every time oil is drained. Remove strainer cover with a face spanner wrench, pull out strainer, wash in naphtha, blow clean with compressed air and replace.

Coolant Tank Capacity: 6 gallons (23 liters).

MOTOR LUBRICATION—As each customer selects his own make of motor it is impossible to give exact lubrication instructions here. However, all motor manufacturers have full instructions, which may be obtained upon receipt of motor serial number.

CAUTION—Lubricate periodically according to motor manufacturers' instructions. Do NOT over lubricate. Never allow a grease lubricated bearing housing to become more than 1/3 to 1/2 full of grease.



FIGURES 16A and 16B

LUBRICATION INSTRUCTIONS AND SPECIFICATIONS

2MI VERTICAL MACHINE ONLY

(See Lubrication Diagrams, Above)

Interval	Station No. and Part Lubricated	Lubricating Instructions	Lubricant Specifications
Daily (8 Hours)	19, 20, 21—Sliding ways in vertical head	Fill oil cups	CMMCo.—No. P-55 Rust and oxidation inhibited mineral oil.
	22—Bearings and gears in vertical head	Check oil level daily and refill to high limit when level drops to low limit.	Viscosity 200 to 220 SSU at 100° F.
Monthly (160 Hours)	17, 18—Counterweight sprocket shaft bearings	Inject 2 or 3 shots of grease from hand gun	CMMCo. — No. P-37 16% - 20% calcium soap. Worked Penetration No. 230-250. Viscosity of oil used 100 to 115 SSU at 100° F.

INSTALLATION INSTRUCTIONS

To obtain accurate results from a milling machine, over a long period of time, three requirements must be met. First, foundation upon which the machine rests must be heavy enough to maintain stability and flatness under machine's weight. Second, machine must be carefully leveled and the level maintained by periodic checks. Third, machine should be anchored firmly to the floor.

Foundation

Special foundations for Cincinnati Nos. 2ML, 2MI and 3MI Milling Machines are not required. Any substantial floor, wood or concrete, fairly flat, and sufficiently sturdy to hold machine's weight without excess vibration, will be satisfactory. (The 2ML type machine weighs approximately 4000 lbs., the 2MI from 4500 to 5000 lbs. and the 3MI from 6000 to 6300 lbs.) Select a zone free from extraneous vibration.

Lifting Machine

The plain and universal machines may be lifted by a crane with a rope or cable sling around the overarm (Figure 17A). Center the overarm and lock in position before lifting.

The vertical machines may be lifted by a crane with a rope or cable sling around the throat (Figure 17B). Before lifting, run saddle forward on knee to balance machine weight.

If a cable or chain sling is used protect machine surfaces with leather or wood blocks.

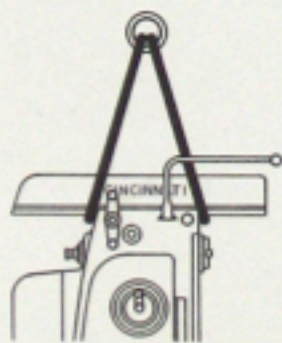


FIGURE 17A
Lifting Horizontal
Machine

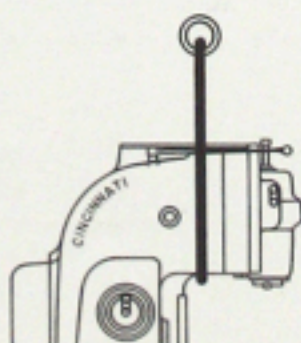


FIGURE 17B
Lifting Vertical
Machine

Bolting Machine to Floor (Figure 17C)

When preparing for this operation, notice that center distances of bolt holes given on "Dimensional Drawings" are approximated. If the floor is concrete, drill the bolt holes about 6" in diameter. Insert the four hold down bolts through 1-1/2" pipes as illustrated in Figure 17C, and fill each pipe with dry sand. Lower machine on two 1" thick boards and engage a nut sufficiently to hold each bolt. Fill the holes around pipes with quick drying cement, thin enough to flow easily. When cement is dry, remove boards, level machine and tighten hold down bolts.

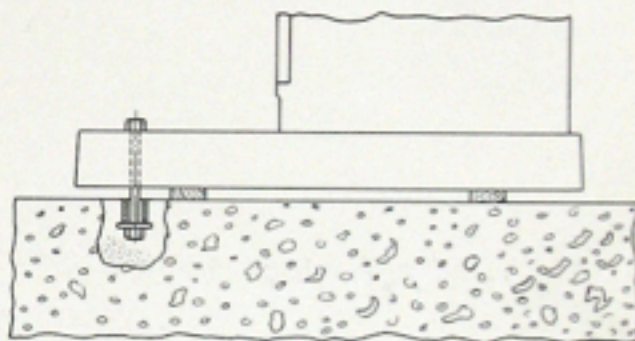


FIGURE 17C
Bolting Machine to Foundation

Leveling

For leveling machine tools, a sensitive, graduated tube spirit level, reading to 10 seconds per graduation (.0005" per foot) and provided with screw adjustment, is required. A carpenter's level or the bulb in a machinist's combination square is not good enough. Table must be clean and free of burrs. Place laminated shims under corners of base until machine is level in all directions. Now place additional shims under base to evenly distribute weight of machine and recheck for level. Check and adjust machine level periodically.

Cleaning

The machine should never be cleaned with a blast from an air hose as it will drive grit and dirt into ways and bearings. Use only lint-free rags for plain surface and a stiff bristle brush for corners. Prevent formation of permanent stain by periodic cleaning.

ADJUSTMENTS

To Adjust Gibs (Figure 18A)

Headless type taper gibs are provided to compensate for wear of bearing surfaces between sliding elements at knee and column, saddle and table, vertical head and column. Keep these sliding surfaces clean and well oiled to prevent undue wear.

1. Set power feed engaging lever of the unit containing gib to be adjusted, in a neutral position.
2. Turn Adjusting Screw in a clockwise direction to force gib in until hand movement of slide is tight, but not locked, then back off screw approximately one full turn. This setting should allow free movement of unit by handwheel with only a slight drag.

CAUTION -- Too tight adjustment of gibs squeezes out the oil film, causing undue wear and scoring.

Do not adjust gibs as a cure-all for vibration. Check cutter design (rake and clearance angles, etc.), nature of work, cutter rpm and feed before adjusting gibs.

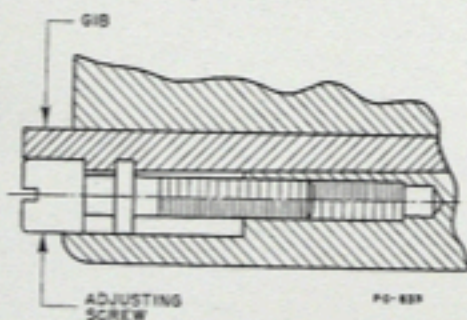


FIGURE 18A

Section Through Headless Type Gib for Knee

To Adjust Table Lead Screw Bearing (Figure 18B)

The table lead screw operates in two tapered roller bearings at right end and a bronze bushing at left end. When machine leaves our factory the clearance between lead screw and nut, at gib and in bearings, is such that dial at handwheel has approximately 0.005" rotary play. This backlash will increase if roller bearings become loose or feed screw nut wears.

1. Loosen gib by backing off adjusting screw, at left end of table, a few turns.

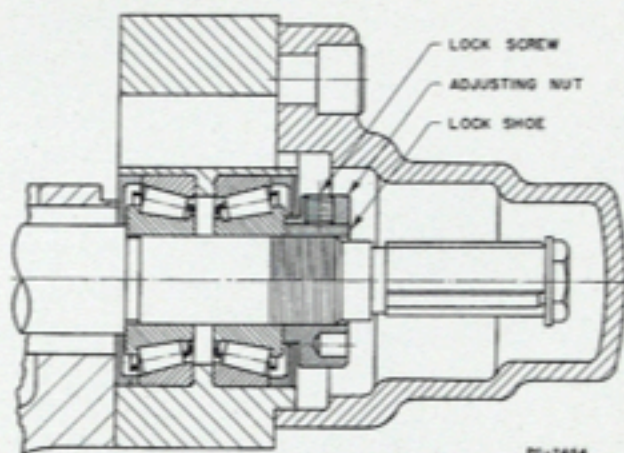


FIGURE 18B

Section Through Right Table Apron

2. Remove bell shaped cover from right end of table. Loosen Lock Screw in Adjusting Nut and tap screw to loosen Lock Shoe. Tighten adjusting nut with a facetype spanner wrench, and then back off approximately 1/16 turn. Tighten lock screw and replace cover.
3. Turn table handwheel by hand to "feel" bearing setting. It should not have been tightened to the point at which it is hard to turn wheel but there should be no play in bearing.
4. Readjust gib.

After bearing adjustment is satisfactory any residual backlash above 0.005" will indicate a worn table lead screw nut that should be replaced if necessary.

To Adjust Driving Clutch (Figure 19A)

The adjustment for main driving clutch is located inside driven sheave. If cutter won't maintain its set speed under a normal load, the clutch is slipping and needs adjustment. If, when the starting lever is engaged with the spindle set for high speed, the spindle hesitates in coming up to full rpm, the clutch is slipping and needs adjusting.

1. Open motor compartment door.
2. Pull out spring loaded Drive Clutch Adjusting Pin and with it turn adjusting yoke clockwise

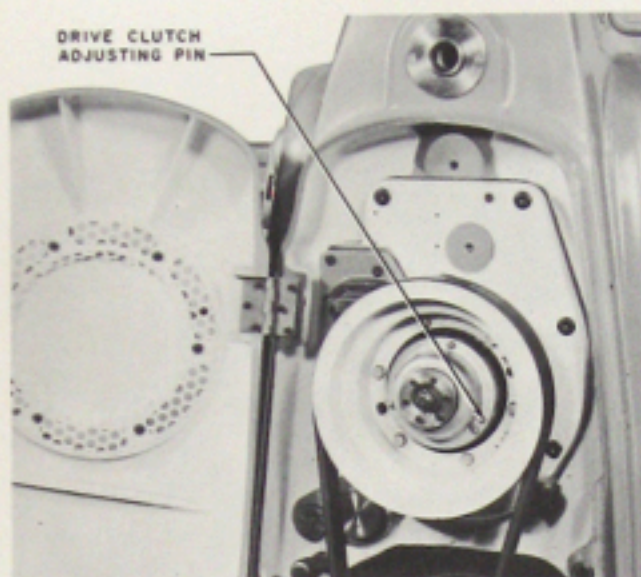


FIGURE 19A
View Into Rear of Column

until spindle starting lever requires distinct pressure to engage. Release pin and slowly rotate yoke counterclockwise until pin drops into a locking hole. Close motor compartment door.

If spindle continues to rotate after starting lever is shifted to stop position, the clutch is too tight and should be freed by pulling out pin and rotating yoke counterclockwise one hole at a time.



FIGURE 19B
Motor Drive in Rear of Column

To Adjust Main Drive Belts (Figure 19B)

Make certain that driving and driven sheaves are in line when motor shaft is at mid position of end play. A V-belt drives through side contact of belt and sheave so it need not be excessively tight. Check belt settings frequently, every few days, until new belts are set to machine and occasionally thereafter. (Keep oil and grease away from belts. Never apply belt dressing to V-belts.) If V-belts slip due to stretch or wear, they can be tightened as follows:

1. Open motor compartment door.
2. Loosen four cap screws "A" and allow motor to settle into belts. Tighten cap screws and close motor compartment door.

To Adjust Cross Screw Bearing (Figure 19C)

The front end of cross feed screw operates in two tapered roller bearings while the rear end is supported by straight roller bearings. When machine leaves our factory the clearance between feed screw and nut, at gib and in bearings, is such that dial at handwheel has approximately 0.005" rotary play. This backlash will increase if roller bearings become loose or feed screw nut wears.

1. Loosen gib by backing off gib adjusting screw, at right side of knee-saddle ways, a few turns.

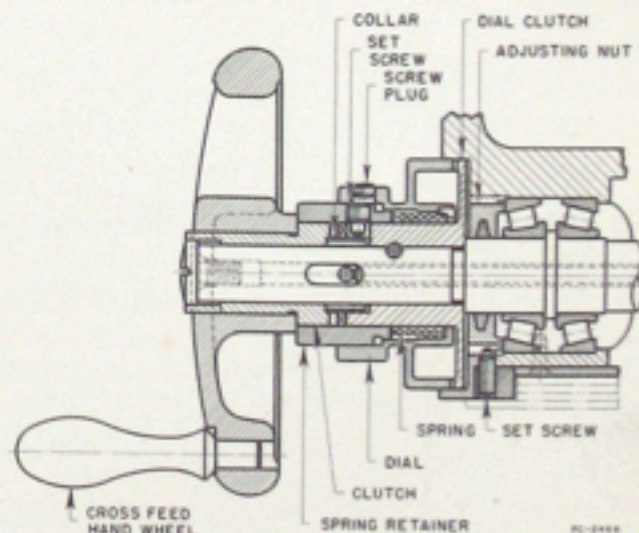


FIGURE 19C
Section Through Cross Screw

2. Remove slotted center screw and slip Cross Feed Handwheel off cross screw. Remove Screw Plug in dial and turn dial until plug hole is in line with Set Screw in Spring Retainer. Remove set screw from retainer and slip Retainer, Dial and Spring from end of cross feed screw.
3. Drive tangential taper pin from Dial Clutch, remove through screw from Collar and slip Collar and dial clutch from cross feed screw.
4. Remove locking Set Screw from side of boss on knee, turn in Adjusting Nut until tight then back off one slot.

Replace all parts and turn cross feed screw by hand to "feel" bearing setting. It should not have been tightened to the point at which it is hard to turn handwheel but there should be no play in the bearings.

5. Readjust gib.

After bearing adjustment is satisfactory any residual backlash above 0.005" will indicate a worn cross feed screw nut that should be replaced if necessary.

To Adjust Backlash Eliminator (Figure 20A)

Normally the mechanism is self compensating for wear so should not require adjustment for many months.

Any need for adjustment of the backlash eliminator will be indicated by:

- (a) Lunging table movements while climb milling indicates that the backlash (B/L) eliminator nuts are loose or worn and need adjusting. Normally the knurled actuating knob at front of saddle should turn rather easily over most of approximately 5 turns from fully engaged to fully disengaged. If it turns stiffly through the entire range this is another indication that B/L mechanism needs adjusting.
- (b) Difficult manual operation of table might indicate too tight an adjustment.

The backlash (B/L) eliminator should be adjusted as follows:

1. Remove right and left aprons from table per paragraphs 1 through 3 on page 27 under To Remove Table and Lead Screw. Pencil mark location of table gib, (for ease in resetting) loosen it slightly and slide table to right far enough to uncover backlash nuts. Support outer

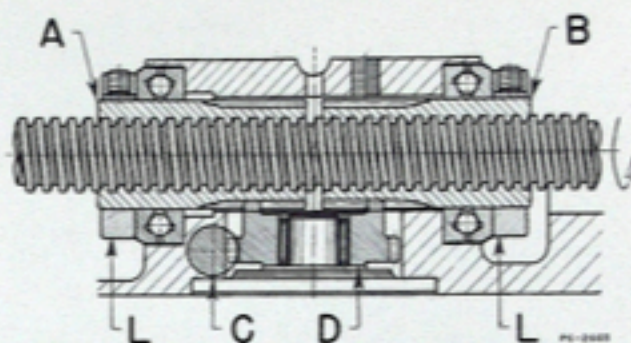


FIGURE 20A

Section Through Backlash Eliminator

end of table as it is being moved to right.

2. Set B/L actuating knurled knob at front of saddle in disengaged (fully out) position. (There are approximately 5 turns from fully engaged to fully disengaged).

Loosen set screws, tap to loosen lock shoes under screws and tighten backlash nuts (L) so they are snug against their thrust bearings. Normally only a fractional turn of nuts is sufficient. With a rag around leadscrew it should be possible to rotate screw by hand. When knurled knob is turned in 2 to 2-1/2 turns it should be impossible to rotate leadscrew by hand but it should be possible to turn knurled knob in another 2 to 2-1/2 turns to make backlash fully effective.

It may be necessary to further tighten or slightly loosen backlash nuts (L) to obtain correct setting. Tighten set screws to lock nuts.

3. Slide table back into position, mount both aprons, adjust table lead screw bearings and reset table gib.

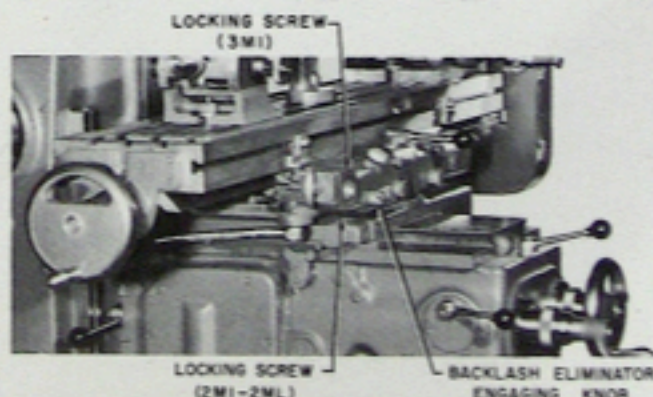


FIGURE 20B

Saddle and Housing--Universal Machine

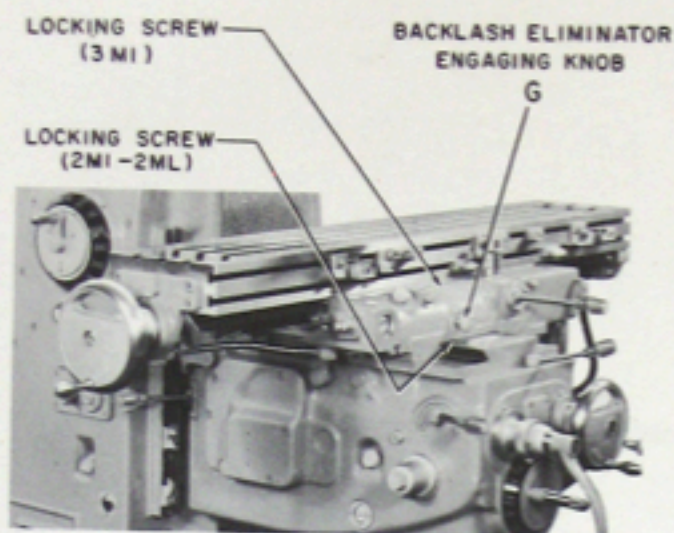


FIGURE 21
Knee and Saddle--Plain Machine

To Adjust Hydraulic Oil Pressure (Figures 6A and 12)

If gears in shifter bracket clash when changing speeds, shift improperly, or fail to shift, it is an indication that oil pressure is low.

Oil pressure should be checked periodically and, if necessary, adjusted as follows:

1. Make certain column oil level is correct. Remove 1/8" pipe plug from bushing at top center of gear shifter bracket and install a 500-lb. pressure gage.
2. Open rear door, unscrew 1/4" pipe cap from nipple at left of pulley bracket and remove locking set screw from inside nipple. Start machine and adjust set screw in nipple until pressure on gage registers 200-210 psi.
3. Replace locking set screw, pipe cap and 3/4" pipe plug.

To Adjust Arbor Support Bushings

Looseness, that would cause unevenness of finish, or possibly chatter, would indicate necessity for bearing adjustment. An overly hot arbor would indicate too tight a bearing that should be relieved.

The bushing, mounted in a tapered bore, is closed

around arbor journal as it is pulled into arbor support by a nut or screw.

1. Start machine, set highest spindle speed at gear shifter bracket and set reversing lever under speed dial in neutral (center) position. Place starting lever in stop position.
2. Rotate spindle and arbor by hand to feel torque required. Turn lock roller (198A) until flat on roller faces arbor bushing adjusting nut (199A). (See page 118.) Tighten adjusting nut, while rotating spindle by hand, until a slight drag is felt as bushing is squeezed around shaft. Lock adjusting nut by rotating lock roller to engage a serration on nut.
3. Make certain that arbor reservoir contains sufficient oil.

To Adjust Dynapoise Overarm

The dynapoise overarm used with this machine has been set at our factory to prevent cutter chatter under most conditions. However, under very adverse conditions, if chatter occurs, the overarm should be readjusted as follows:

(Before changing overarm setting make certain gibs, clamps, fixtures, and lead screw bearings are set correctly. Also see that speeds, feeds and cutters are correct for the cut--sometimes a heavier chip per tooth will help.)

1. Remove screw from name plate at front of overarm and swing plate down on pin at opposite end. Remove lock key (172A) from adjusting rod (162A) under plate. (See page 118.)
2. While machine is running in cut, tighten or loosen, by rotational increments of 1/4 turn, adjusting rod in overarm until chatter disappears. Replace lock key and name plate.

CAUTION -- Never leave adjusting rod locked tightly against internal compression spring. Rod must, at all times, be free enough to be rotated a few turns in either direction.

To Adjust Spindle Bearings

If, when face milling, the work piece shows steps between cuts, it would indicate excessive spindle

end play provided the cutter is sharp and true. Excessive end play might also be indicated, if it is impossible to mill a long straight slot. (Before adjusting spindle bearings make certain that gibs are correctly adjusted as loose gibs could cause these same errors in cutting.)

1. Set the spindle reversing lever on face of shifter bracket in neutral position so spindle will rotate easily.
2. Remove two driving keys from face of spindle and insert a 1" wide flat steel piece approximately 12" long in key slots.
3. **HORIZONTAL MACHINES**--Move overarm forward on machine until rectangular plate under it can be lifted from top of column. Move overarm with pilot wheel then pull further by hand. Support front end of overarm while it is in this forward position. Remove plug "A". (Figure 22A.)

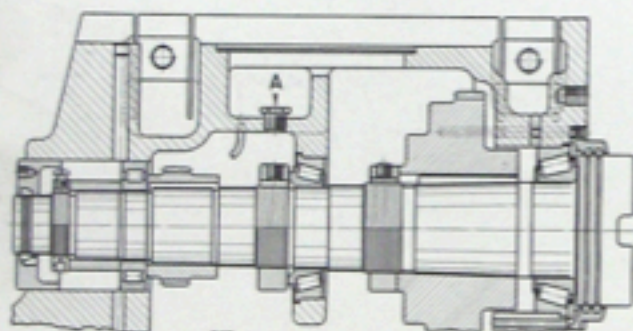


FIGURE 22A
Section Through Horizontal Spindle

VERTICAL MACHINES--Remove pipe plug from left side of vertical column, just below back gear lever.

4. Insert a long handled socket head key into 1/2" locking set screw in spindle bearing adjusting nut. Loosen screw and tap to loosen lock shoe under it.
5. Insert a 3/8" diameter bar into a radial hole of adjusting nut and, using flat bar in key slots,

rotate spindle counterclockwise a revolution, then clockwise until bearings are snug and finally counterclockwise again approximately an inch on circumference.

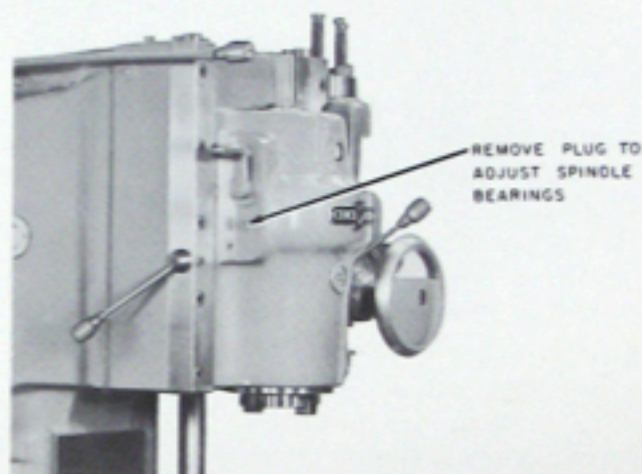


FIGURE 22B
Left Side of Vertical Head

6. Tighten locking set screw and remove screw key. Rotate spindle by hand to seat bearing and feel the bearing setting. Replace pipe plug in side of vertical head, on Vertical Machines and rectangular plate at top of column on Horizontal Machines. Push overarm back into place. Replace driving keys in spindle.

Machines that are used for general purpose work should have approximately .001" end play in spindle bearings. Machines that are used for high-speed work exclusively should have approximately .002" end play in spindle bearings. Check end play by mounting a 1/10,000" indicator so its stem contacts spindle nose and lightly tapping spindle forward and back while reading indicator.

If spindle runs hot the bearings have been set too tight. Check actual temperature by placing a thermometer in a spindle cap screw hole. Normally the recorded temperature should never exceed 115-120°.

DISMANTLING INSTRUCTIONS

To Remove and Dismantle Shifter Bracket (Figures 6A, 23A)

1. Start machine and run spindle at 25 rpm. (This speed sets forks in shifter bracket at best position for reinstalling bracket into column--top forks together and center forks spread apart.) Place spindle reverse lever in "Spindle Runs Left" position. Disengage spindle starting lever and stop machine.
2. Remove nine cap screws from around shifter bracket. (Top four screws are longest, two center screws are medium length and three bottom screws are shortest.)
3. Remove 1/2" set screw from center of top edge of shifter bracket and insert an eye bolt into hole. Attach a crane to eye bolt and remove slack from cable.

Tap around outside of bracket to break seal, work bracket straight out from column off oil tube at top and lift out of column with crane.



FIGURE 23A
Removing Shifter Bracket

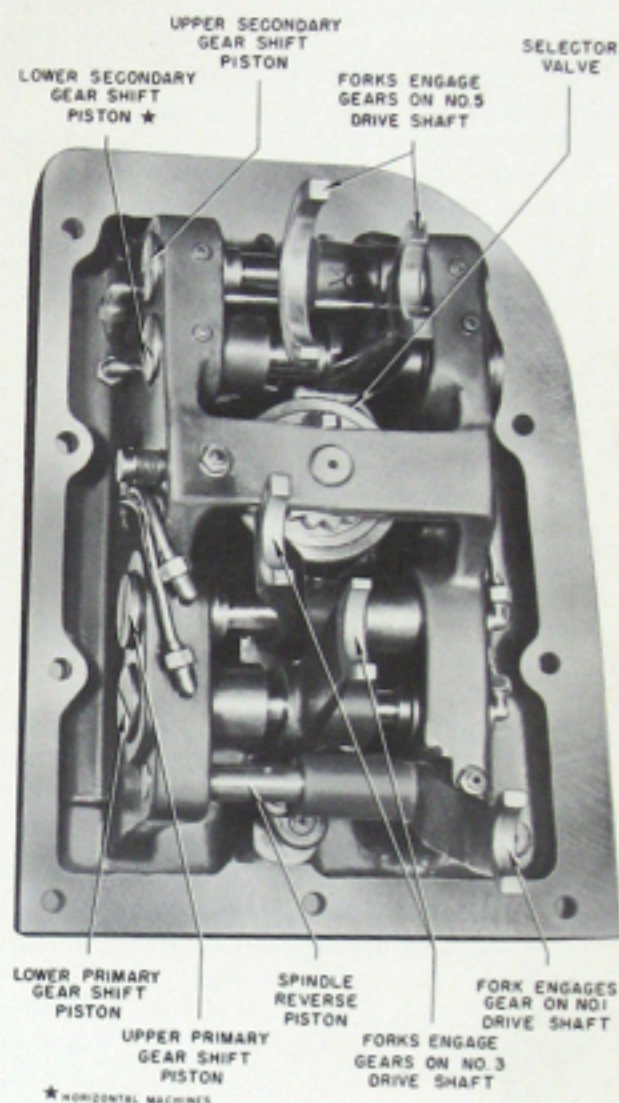


FIGURE 23B
Rear of Shifter Bracket

Before reinstalling, clean contact faces of bracket and paint with sealing compound. Swing bracket squarely into place so it rests on front edge of shelf under opening. Check through top edge to make certain that forks align with grooves in gears and oil tube at top edge will enter hole in bracket. Push bracket squarely into place, onto taper of oil tube, and fasten with one cap screw at top and one at bottom.

Start machine and check spindle speed and spindle reverse to make certain forks are engaged correctly. Fasten bracket with remaining seven screws.

4. Forks 60A, 75A, 86A and 92A can be removed after unscrewing end plugs (56A, 68A, 77A, 89A) and removing straight pins through forks and plungers. It is necessary to remove fork 60A before 75A and fork 92A before 86A. (See page 42.)

A ball locking device under forks 75A and 92A locks one fork in neutral while the other is moving. Racks (43A and 50A, page 40) under 1/2" dia. balls (48A, 52A) should engage the compensating pinion (42A) so that when top of one ball is flush with the surface the other ball protrudes slightly over 1/3 its diameter. A fitted 7/16" diameter brass spacer (51A) approximately 5/16" thick is between upper ball and its rack. Lateral movement of compensating pinion is prevented by a dog point set screw (39A) that enters a groove in pinion.

5. Tag and remove all tubing. Remove set screw, selector valve detent (53A) and locking set screw at rear of selector valve shaft (11A). Unscrew capstan lock nut (17A) and remove dial (18A) from front of bracket. Tap shaft (11A) and remove selector valve (27A, 26A, 25A, 21A) assembly. Speed change crank (2A) and reduction gearing are held in place by three small screws. Internal gear (20A) is pinned with a straight pin.

To Remove and Dismantle Main Drive Bracket (Figure 24 and pages 106, 108)

1. Loosen clamp screws and raise main drive motor so belts can be removed.
2. Proceed as per paragraphs 1 through 3, under "To Remove and Dismantle Shifter Bracket", page 23.
3. Remove five 3/8" cap screws and one 5/8" cap screw holding the pump body (62A) to the drive bracket, and remove pump. On 2ML MACHINES the driven sheave (103A, page 108) must be removed from its hub (104A) by removing six screws (110A) before pump body (62A) can be removed.

The filler pipe fitting at the lower right side of the drive bracket (as viewed from the rear of the machine) must be turned out of the way to make room for removing the bracket.

4. Remove the remaining six screws through flange of drive bracket. Put a rope sling around hub of driven sheave, as close to bracket as possible, attach to a crane and remove slack. Insert two steel bars, 7/8" dia. and approximately

3' long, into bottom holes of bracket flange to counterbalance bracket weight as it is removed from column.

5. With a brass rod, tap around inside of bracket flange to break seal and start it off double diameter locating pins (38A) through flange, and pilot (27A) at top front of bracket. Work the bracket straight out of column. (See pages 106 and 108.)

Before assembling, clean and seal mating surfaces of bracket and column. Work bracket into column so pilot enters its bored hole and straight pins enter holes in column. Make certain that clutch operating lever engages detent on vertical spindle starting shaft, pump idler gear meshes with pump drive gear in column and 4th shaft gear engages column gear. Pull drive bracket into column with screws through flange. Replace pump and straighten filler pipe fitting. Replace driven sheave (103A) on 2ML MACHINE.

6. To remove No. 4 drive shaft (23A)--take off bracket pilot (27A) and shoe type lock nut (26A) under it; remove snap ring (1A) from opposite end and straight pin through gear (4A). Tap shaft toward rear out of its bearings. Pilot is sliding fit in bracket.
7. To remove No. 1 drive shaft (113A) with clutch--remove spanner nut (76A), brake plate housing (73A), spanner nut (69A), brake assembly (65A, 72A) and straight pin (114A). Through hole in sheave (103A), remove screws (112A) from flange of sleeve (108A). Through bracket tap sheave sleeve (108A) to break seal at flange.

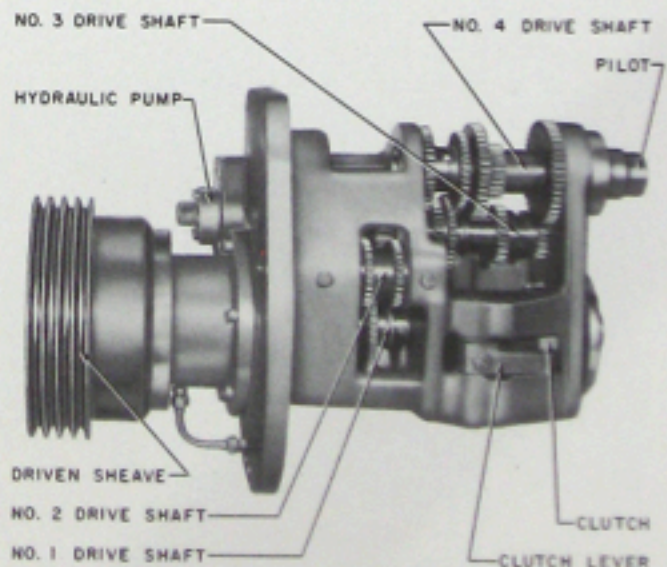


FIGURE 24 - Main Drive Bracket

Sheave sleeve assembly with drive shaft can now be pulled out of bracket.

To remove main drive clutch--unscrew nut (127A), slip off cone ring (122A), pull out latching pin and unscrew roller finger holder (123A). Unscrew set screw from clutch hub and slip hub from spline. (This can be done easier if driven sheave is first removed.)

8. To remove No. 3 drive shaft (30A) it is first necessary to remove No. 1 drive shaft per paragraph 7 on page 24. Remove snap ring (22A) and straight pin from collar (21A) outside of pump idler gear (19A). Remove No. 4 hexagon head taper pin (16A) from side of bracket and pull stud (17A) out of bracket. Stud is tapped 3/8-16 to aid removal. Unscrew shoe type lock nut from outer end of No. 3 drive shaft and pry off gear (9A). Remove shoe type lock nut (33A) from outer end of shaft, and tap shaft out of its bearings.
9. To remove No. 2 Drive Shaft it is first necessary to remove No. 1 drive shaft per paragraph 7 on page 24. Remove No. 6 hexagon head taper pin and pull eccentric plug (40A). (Plug is tapped 1/2-13 to aid removal.) Remove No. 6 hexagon head taper pin and push out eccentric stud (43A). When assembling, use eccentric stud to correctly mesh gears on Numbers 1, 2, and 3 drive shafts. Then lock in place by driving in eccentric plug.

To Remove and Dismantle Feed Drive Bracket (Feed Box) (Figures 25A, 25B and page 46)

1. Remove 1/4" pipe plug (28A) and 3/8" cone point set screw (26A) from face of drive bracket under knee. Shine light through hole and turn

feed change crank until milled slot in primary cam faces hole.

Screw 3/8" set screw into milled slot to prevent rotation while bracket is out--if primary cam will not be removed. Approximately 2-1/2 full turns of set screw are necessary to engage slot. Make a note of feed rate or lock feed change lever in position to simplify assembly.

It will be necessary to disengage the cam locking set screw before feed change lever can again be rotated after reassembling. If this bracket was removed without locking primary cam it may be necessary to synchronize gearing with feed dial. See page 27, under "To Remove Feed Dial Assembly from Knee."

2. Remove six of the eight cap screws and the two hexagon head taper pins that fasten feed bracket to knee. Loosen the two remaining screws and tap flange to break seal. Elevate knee to within approximately 11" of topmost position then block up under bracket. Remove two remaining screws, elevate knee until clear of bracket and slide bracket forward on blocks.

Before assembling paint flange with a sealing compound.

3. Nos. 1, 2 and 3 shafts can be removed independently after unscrewing castellated nuts. Nos. 1 and 2 shafts are slipped out from front to rear of bracket. Number 3 shaft is slipped out of bracket from rear toward front of bracket.
4. Remove snap ring (18A) and set screw that locks primary cam (16A) on its shaft. Tap shaft (5A) out of bracket from rear toward front. (See page 46.)

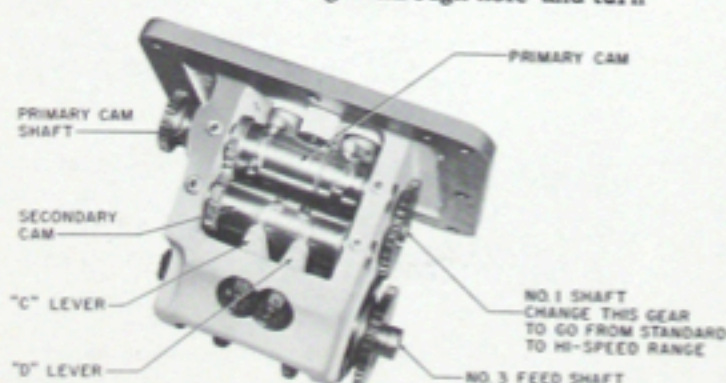


FIGURE 25A
Front of Feed Box

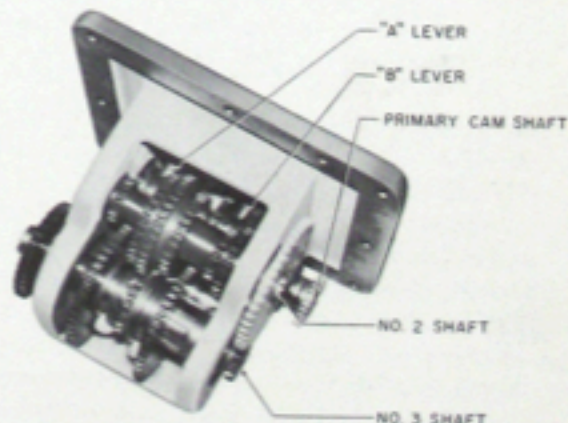


FIGURE 25B
Rear of Feed Box

5. Loosen lock nuts and remove screws that lock secondary cam studs (10A and 15A) in bracket. Pull studs from bracket and lift out cam (12A). (Studs are tapped 3/8"-16 as aid for removal.)

These studs, with their shoulders bearing against secondary cam, are used to locate the 3rd drive shaft gearing in relation to meshing gears on 2nd shaft. Studs are spot drilled to receive points of locking set screws.

To Change Feed Range from 1/4-30 to 1/2-60

Proceed as per instructions on page 25, under "To Remove Feed Drive Bracket." Remove rear control bracket (521A) or pump bracket (591A) from left rear of knee. (See pages 68 and 72)

Loosen set screw, tap to loosen lock shoe underneath, and remove lock nut (623A). (See page 72) Remove gear (622A), tap feed box drive gear (617A) toward the front of the knee and remove it through the feed drive bracket opening. The standard (1/4 - 30) feed rate is obtained with a 17-tooth gear while high (1/2 - 60) feed rate is obtained with a 26-tooth gear.

Remove gear from No. 1 shaft of feed drive bracket. (Figure 25A). Standard feed rate is obtained with a 35-tooth gear while high feed rate is obtained with a 26-tooth gear.

To Remove Cross Screw from Knee

1. Run saddle about half way back on knee and remove front sliding plates from right side of knee. (See Figure 8.) Place a wooden block between column and back of saddle.
2. Remove slotted center screw from cross feed handwheel (71A) and remove handwheel with its dog clutch (72A). (See page 50.) Remove slotted screw from knurled section of dial (84A), loosen socket set screw in retaining spring bushing (83A), under dial, and, remove bushing from inner clutch.
3. Unscrew headless screw (76A) and remove outer clutch knockout collar (85A). Drive out taper pin and remove inner clutch (78A). Remove set screw through side of knee and remove bearing

adjusting nut (79A). Through opening at right side of knee, under front sliding plates, unscrew slotted screw through inner clutch knockout collar (91A).

Replace and pin inner clutch (78A). With handwheel in place turn cross screw clockwise to remove it from knee.

4. When assembling, have saddle at front of knee and insert cross screw by hand. When screw is nearly fully entered the splines will catch on grooves in cross screw sleeve. As this alignment is felt, push knee back on saddle by hand so spline is fully engaged.

To Remove Front Elevating Shaft

1. Remove rear control bracket or rectangular plate from rear left side of knee. Remove feed drive bracket from bottom of knee, per instructions on page 25. Remove two cap screws, tap mounting plate to loosen taper pins, and pull power vertical feed lever from left side of knee. (See Figure 4.)
2. Unscrew 1/2" set screw (130A), with locknut, from left side of knee. (See page 52.)

Through bottom opening, extract cotter key and remove vertical pin (136A) from brake hub (142A) on front elevating shaft. Slide brake back along shaft, extract horizontal pin (141A) from rear of brake shoes, open shoes and remove. (When assembling, make certain that set screw engaging slot in hub is down.)

3. Remove crank (112A) from elevating shaft (127A). Unscrew set screw from spring sleeve (113A) at front of shaft and remove sleeve, spring and dial (116A).

Remove headless screw and slip knockout collar (117A) off shaft. Extract taper pin and remove dial clutch (120A). (Dial clutch flange has two 3/8" tapped holes for jack screws if necessary.)

Remove three cap screws and pull bearing retainer (122A) from front of knee. Screw a 3/8" rod, with a slidable weight and nut on outer end, into front of elevating shaft and hammer shaft out of knee.

To Remove Feed Dial Assembly from Knee

Drive taper pin (280A) from lever. (See page 58.) Remove two set screws (281A), (282A), through bottom of boss on knee. Remove set screw (277A) from center of pinion (278A), screw in a 1/4 - 20 rod and pull feed dial assembly from knee.

To remove interconnecting pinions (288A) (286A), it is necessary to first remove feed drive bracket from knee per instructions on page 25.

If drive bracket had been removed without cams being locked per instructions on page 25, under "To Remove Drive Bracket", it may be necessary to synchronize its gearing to that of dial assembly. With machine running, rotate feed change crank until slowest feed is obtained. If crank is not engaged in either of two holding holes in flange proceed as follows:

Remove handle assembly, remove center set screw (277A) from pinion shaft and loosen locking set screw under hub. Screw a 1/4 - 20 threaded rod into shaft and push back far enough to clear its meshing gear. Rotate pinion until taper pin hole through shaft is at right angles to holding holes in plate (273A) on knee, pull pinion forward into mesh and lock, replace crank and insert taper pin.

To Remove Table and Lead Screw

1. Take off bell shaped cover (423A, page 92) at right end of table (375A, page 90). Loosen lock screw, tap to free lock shoe under it, and remove bearing adjusting nut (367A). Remove four screws, tap apron (429A) to break sealed joint and slide right apron, with its two double diameter dowel pins, off lead screw (364A).
2. Remove slotted center screw (389A) and slip hand wheel (391A), outer clutch (402A), and spring from left end of lead screw. Remove screws from opposite sides of dial (408A) and rotate dial until screw holes are aligned with pin through inner clutch (410A) and lead screw. Drive out pin and remove inner clutch and clutch dial. Remove four screws, tap apron (412A) to break sealed joint and slide apron with its two double diameter dowel pins and lead screw bushing, off lead screw.
3. Unscrew gib screw at left end and remove table gib (388A, page 90). (If gib setting was correct,

it will facilitate assembly to pencil mark gib at edge of table before removing.) Fasten an eye clamp to center slot of table, relieve weight of table with a crane and slide it out of V-ways. Entire length of table must be supported as it is removed if no crane is available. (Left apron could be left in place and table removed from right to left.)

4. Run lead screw out of nut (361A) in saddle (housing on universal machines) from left to right. Support lead screw as it is removed, either by power or hand.

Lead screw can be removed without taking off table after right apron has been removed and apron and dial and inner clutch have been taken off left end.

If machine is equipped with a backlash eliminator the table should always be removed before lead screw. When assembling, always have lead screw in place in backlash nuts (365A) before sliding table into place. Backlash nuts must be held in place as lead screw is entered.

Run leadscrew into nuts until it bottoms against shoulder, back off and lock with nut at right end so there will be .005" backlash on handwheel dial at left end.

5. Table can be moved far enough to right to work on backlash nuts, as follows:

Run table about 1/3 its travel to left. Remove screws from left apron and tap to break seal. Remove bell housing and lock nut from right end of lead screw, slide table to right along its ways until backlash nuts are uncovered. Be certain to support table as it is pulled out and block up under overhang.

To Remove Universal Housing from Saddle (See pages 82, 84 and 86)

Remove universal clamp screws and wedges (254A, 256A, 305A, 315A) from front and rear of universal housing (244A). Advance saddle to front of knee and retract overarm. If table is in place, center it and with a sling around ends of table lift housing straight up off center boss of saddle (188A) and four saddle housing clamps (253A, 304A). If table had been removed use a sling around right rear and left front corners of housing.

When assembling make certain that clamps are turned so clamping grooves face out and insert wedges with bevel on end turned up. Housing must be set down squarely on clamps and center boss of saddle. Gearing will start to mesh just as center boss enters bore in housing.

To Remove Saddle from Knee

1. Proceed as per paragraphs 1 through 3, page 26, under "To Remove Cross Screw from Knee."
2. Unscrew set screw (167A) from front of knee and lift power crossfeed lever (176A) and detent assembly from top front of knee. (See page 54.) Saddle cannot be removed with this lever in place.
3. Remove five cap screws (23A, page 76) and tap cross feed nut bracket (24A), with crossfeed nut (95A, page 50) in place, from the under saddle bracket (19A, page 76). Remove three cap screw (52A-1, page 48) that fasten rear sliding plates to inside of under saddle bracket.
4. Remove four screws (43A, page 76) from cover (42A) to disconnect telescopic spline shaft guard from rear of under saddle bracket (19A). Remove saddle gib.

If table had been removed put a rope sling around right rear and left front corners, suspend from a crane and slide saddle off knee.

To Remove Knee Drive Motor and Mounting Bracket (See pages 66 & 132)

1. Break electrical connections to motor. Drain oil from knee.
2. Remove four screws that fasten the motor to its mounting bracket and work motor straight out. (On some makes of motors it will be necessary to remove the motor housings to gain access to the screws that fasten motor to mounting bracket).
3. Remove 7 screws and pry mounting bracket away from knee. (On vertical machines with power feed to vertical head it is necessary to

first remove the upper power feed bracket as per instructions on page 33. [On some vertical machines it is possible to lower the knee by power to its lowest position, then further lower it by hand one more turn to allow removal of the drive motor mounting bracket. To remove bracket in this manner first unscrew cap (2A, page 132) and raise telescopic tubes up against the power feed bracket (68, page 134) and prop or wire them there. Remove the screws holding the mounting bracket and pry bracket from knee. By pulling bracket away from knee at its bottom edge and at the same time lowering it the splined connection between vertical spline shaft (1A, page 132) and bevel gear (147A, page 136) can be broken.]

To Remove Knee with Table (For replacement of rapid traverse clutch)

1. Proceed as per instructions on this page, under "To Remove Knee Drive Motor and Mounting Bracket". Position knee about 2/3 up on column.

Center table, place a rope sling around ends, attach to a crane and remove slack. Loosen knee clamp at the left rear of knee; remove center screw and tap lever (31A) to rear off serrations of clamping screw. Unscrew gib screw and pull gib (40A) from left side of knee. Unscrew clamping screw (30A), four cap screws and lift knee guide (39A) out of its keyways on left side of knee. (See page 48.)

2. Remove two set screws (569A) through telescopic ring (572A) over base of elevating pedestal (566A). (See page 70.) Unscrew top outer telescopic tube (575A) from bottom of knee. (Tube has 27 threads per inch.) Rap second telescopic tube smartly upward against lip of outer tube to raise ring off base of pedestal base. Carefully screw outer tube back into bottom of knee, collapse tubes and block up under knee.

Remove two cap screws (571A) through base of pedestal and rap it to break seal between column and pedestal. Raise assembly until taper pins (568A) through pedestal base are clear. Rotate rear of knee to right and swing away from column.

To Remove Rapid Traverse Clutch and Gears (See page 62)

1. Proceed as per instructions on page 28, under "To Remove Knee with Table".
2. Thru opening in knee, left by removal of Motor Drive Mounting Bracket, loosen set screw, tap to loosen shoe underneath and remove Locknut (379A) from threaded portion of Rapid Traverse Clutch Shaft (372A).
3. Remove 4 screws (355A) and Cap (354A) from rear of knee. Remove 4 screws (349A). Screw a 3/8"-16 threaded rod, mounted with a slidable weight and having a nut on its outer end, into holes in outer face of Bearing Retainer Bushing (348A). Tap bushing from rear of knee with shaft (372A) and Rapid Traverse Clutch Assembly in place. Bevel Gear (380A) can be lifted thru opening in right side of knee.
4. Loosen set screw, tap to loosen lock shoe under screw and remove lock nut (352A) from the end of Rapid Traverse Clutch shaft (372A). Remove

bearing retainer bushing (348A), roller bearings, Rapid Traverse Clutch Gear (345A) and the clutch assembly from shaft (372A).

To Remove Knee (for partial or complete dismantling)

1. Drain oil from knee. Proceed as per instructions on page 28, under "To Remove Saddle"; as per instructions on page 28, under "To Remove Knee Drive Motor and Mounting Bracket".
2. Remove cap screws and rap circular plate (8A) at top rear of knee to remove it. (See page 48.) Unscrew outer and inner telescopic tubes from under knee. (Items 575A, 587A, page 70.) Run knee down until it is 1/3 up from bottom position.
3. Place a rope sling around knee so one loop is under rear and the other loop is under front of knee. The loop should cross and be attached to a crane hook at the top center of knee about an inch forward of edge of opening for elevating screw. (This point is over center of gravity of knee.)

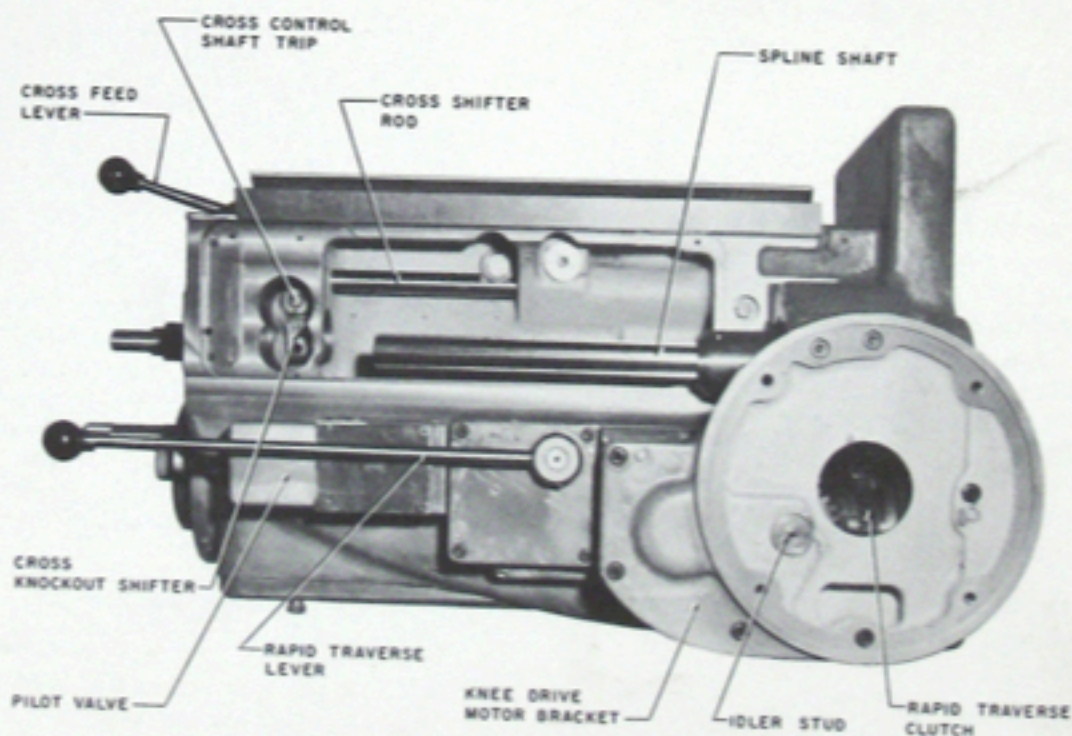


FIGURE 29
Right Side Of Knee

4. Loosen locking cap screw and remove capstan type nut (577A) from top of elevating screw (563A) page 70. Loosen knee clamp (31A) at left rear of knee; remove center screw and tap lever off serrations of clamping screw (30A). (See page 48.) Unscrew gib screw and pull gib (40A) from left side of knee. Unscrew clamping screw, four cap screws and lift knee guide (39A) out of its keyways on left side of knee.

Raise knee to free key in elevating screw from elevating bevel gear (583A). (See page 70.) Run elevating screw down into nut (564A) by hand, raise knee to clear pedestal, rotate to right and out of knee.

To Remove Safety Clutch and Shaft

(See page 60)

1. Proceed as per instructions, page 29, under "To Remove Knee For Dismantling" and place knee upside down on a bench.
2. Remove cap screws and taper pins from flange, fasten an eyebolt into drain plug hole and lift feed drive bracket out of knee with a crane. It is easier to remove and replace this bracket into knee while knee is upside down.
3. Proceed as per instructions on page 27, under "To Remove Feed Dial Assembly." Remove rectangular plate from rear bottom of knee.
4. Remove drive plug (34A) from front of knee. (See page 48.) Loosen set screw, tap to loosen lock shoe under screw and remove lock nut (299A, page 60). Pull safety clutch assembly (296A) from front end of safety clutch shaft (308A). Remove 4 screws and plug (330A) from rear face of knee. Loosen set screw, tap to loosen shoe under screw and remove lock nut (329A).
5. Remove cotter pin (336A) from the end of feed clutch piston (337A) and unscrew slotted nut (332A). Remove 4 screws (339A) holding feed clutch cylinder assembly (338A) and pull cylinder assembly from rear of knee. Lift feed clutch fork (333A) out of knee.
6. On 2MI and 2ML machines drive safety clutch shaft (308A) forward out of over riding clutch (324A) and knee. (See page 60.) On 3 MI machines drive safety clutch shaft forward out of

over riding clutch (324A), pick out clutch, and then drive shaft toward back and out of knee.

To Remove Vertical and Cross Feed Control Shafts (See pages 54, 58)

1. Proceed as per instructions on page 29, under "To Remove Knee for Dismantling." Remove two set screws, through top of knee, that lock vertical detent shaft bushing (240A) on right side of knee. (See page 58.) Place knee upside down on a table.

Remove cap screws and taper pins from flange, fasten an eyebolt into drain plug hole, tap flange to break seal and lift feed drive bracket out of knee with a crane. Remove rectangular plate from rear bottom of knee and rear control bracket or pump bracket from left rear of knee.

2. Proceed as per paragraph 2, page 26, under "To Remove Front Elevating Shaft From Knee."
3. Tap vertical detent shaft (242A) from right to left out of knee, viewing knee from rear in upside down position. (See page 58.)

Remove two cap screws (252A) and pull power vertical feed trip hand lever (261A) assembly with shaft (260A) from left front of knee. Remove set screw from back of knee and pull power vertical feed trip dog lever (273A) and shaft (238A) from left rear of knee. Drill and tap (1/4-20) sealing plugs (246A, 247A) at ends of vertical feed rod (251A) and remove plugs. Loosen nut on wedge bolt through power elevating clutch fork (249A), tap nut to loosen bolt on shaft, tap vertical feed rod (251A) back until wedge bolt is in line with groove in shaft then lift out wedge bolt. Tap shaft (251A) out of rear of knee and remove fork.

Remove lock washer (417A) and capstan type nut (412A) from rear of knee. (See page 64.) Pull horizontal bevel gear assembly (401A) out rear of knee. End of bevel gear shaft (401A) is tapped 3/8 - 16 to aid removal.

When assembling, set fork (249A, page 58) on vertical feed rod (251A) so clutch (407A, page 64) is centrally located between gears (405A, 413A) with elevating lever in a neutral position.

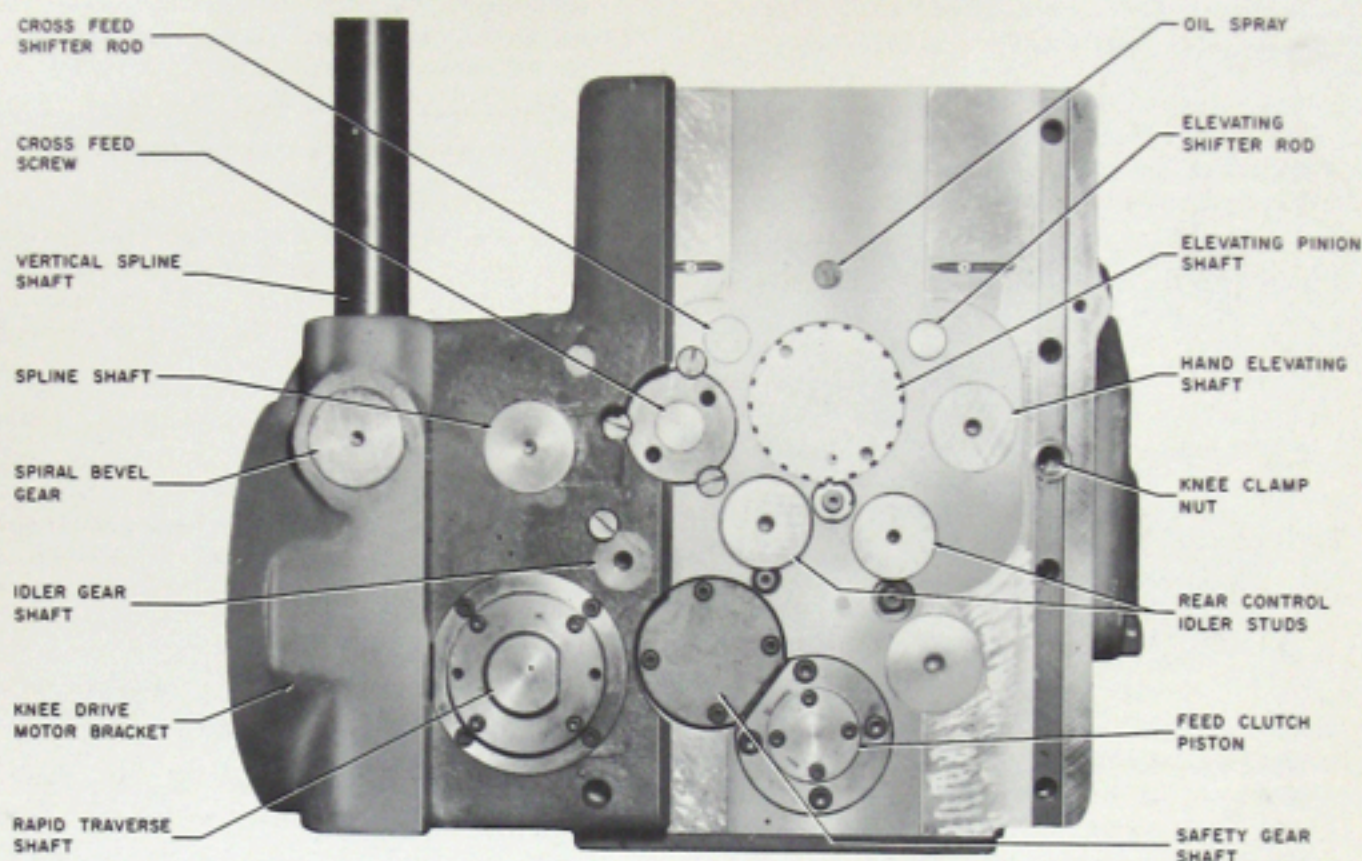


FIGURE 30
Rear View of Knee

4. Tap out taper pin and remove trip lever (150A) from cross feed detent shaft (156A). (See page 54.) Remove cotter pin from detent (159A) and drive shaft from dog end out of knee.
5. Remove collar (145A) and slip hand elevating gear (143A) from rear of knee. (See page 52.)

Drill and tap sealing plug (178A)— $\frac{1}{4}$ "—20— and pull plug from front of knee. (See page 54.) Loosen nut on wedge bolt through fork (183A) that engages power cross feed clutch and tap nut to free bolt. Tap cross feed shaft (179A) from rear out front of machine.

6. If necessary, vertical bevel gear (583A) and telescopic tube sleeve (584A) could now be removed. (See page 70.) Remove set screw from left side of knee that locks telescopic tube sleeve, turn knee right side up and drive vertical bevel gear and tube sleeve down out of knee.

To Remove Cross Screw Clutch and Gears

1. Proceed as per instructions on page 30, under "To Remove Vertical and Cross Feed Control Shafts."
2. Remove three cap screws and pull rear bushing (108A) from back of knee. (See page 50.) With a hook pull out rear needle bearing (107A). Tap rear washer (105A) back on cross screw sleeve (102A) far enough to clear notches of washer from end of sleeve splines, rotate washer 60° to align grooves with splines and start washer onto splines. Tap sleeve out back of knee and remove clutch (104A) and gears (100A, 106A). (It may be necessary to remove taper pin (98A) and move front bushing (97A) forward by tapping on clutch cross feed shaft gear (100A) to gain sufficient clearance to back off and rotate rear washer.)

To Remove 5th Drive Shaft (Horizontal Machines) (See Figure 32)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 4, page 24, under "To Remove Main Drive Bracket".
2. Remove sealing plug (113A)—tapped 1/2"—13 as aid for removal. (See page 114.) Loosen locking screw and unscrew bearing adjusting nut (112A). Tap back gear (105A) back on shaft (approximately 1/16" to 1/8") until notches on bushing (100A) are clear of lugs on shaft (108A). With a screw driver, turn bushing until grooves are in line with lugs and slide gear assembly (105A) forward on shaft. Pull shaft (tapped 3/8"—16 as aid for removal) back out of column far enough to free rear bearing cup (111A) and front cone (96A). (Support gears and shaft as it is moved back.) Drop forward end of shaft and remove, with gears in place, through shifter bracket opening.

When assembling, tap rear cone (110A) onto shaft just far enough so spacer (109A) cannot slip onto bearing diameter of shaft. (This allows free movement of gear (105A) and its bearing assembly so bushing (100A) can be turned to engage notches with lugs.) With gears forward, enter rear end of shaft into bearing bore, slip forward and into front bearing cone (96A). Drive shaft forward into front cone. (Hold gears forward and shaft horizontal so rear cone does not shift and allow spacer (109A) to drop onto small diameter. Also make certain that bushing (100A) does not move forward in bearing.) Slide gear assembly (105A) back on shaft so grooves clear lugs, turn bushing (100A) and slip gear assembly forward to engage notches with lugs. Hold gear (105A) forward with shaft horizontal and drive rear cone onto shaft. Slip rear bearing cup into place so top is cocked out and drive into place by tapping the bottom first. (The tilted entrance allows front edge of bearing to clear shoulder to straight bore in column.) Install bearing adjusting nut and lock.

To Remove 6th Drive Shaft (Spindle on Horizontal Machine)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per

paragraphs 1 through 4, page 24, under "To Remove Drive Bracket"; as per paragraph 2, above, under "To Remove 5th Drive Shaft".

2. Remove dust cap (77A on page 112) from front of column. Remove copper tubing connected to spindle start valve (page 128).

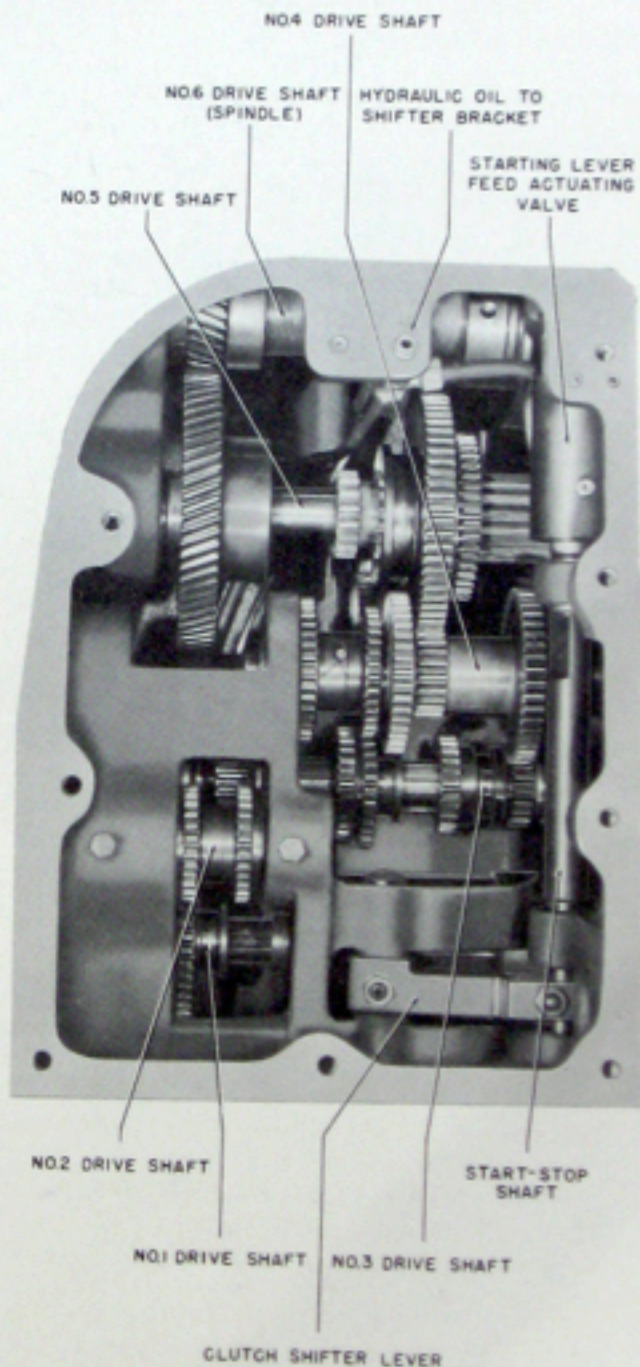


FIGURE 32
Left Side of Column Through
Shifter Bracket Opening

3. Pull spindle bearing cap (87A on page 112) from rear end of spindle. Loosen set screws in shoe type lock nuts (81A), (83A), (90A) and tap to free lock shoes under screws. Remove lock nut (90A) and unscrew lock nuts (81A) and (83A). Tap spindle forward and remove from column.

To Remove 5th Drive Shaft (Vertical Machines)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 3, page 24, under "To Remove Main Drive Bracket."
2. Remove sealing plug at rear of 5th drive shaft. (Plug is tapped 1/2"-13 as aid for removal). Loosen locking screw and unscrew bearing adjusting nut. Break tubing connections at sleeve (236A) on page 120 at upper forward corner of shifter bracket opening in column. Pull shaft (154A) on page 116 (tapped 3/8"-16 as aid for removal) out of column far enough to clear forward bearing while supporting shaft and gears. Drop forward end of shaft and remove.

When assembling do not make tubing connections until 5th drive shaft is installed. Make certain sliding gear on 5th shaft does not contact copper tubing when shifted forward.

To Remove and Dismantle Power Feed to Vertical Head (See pages 132-136)

1. Lower knee to bottom position by power and then turn hand crank, one more turn to further lower knee. Drain oil from power feed bracket. Turn upper telescopic tube (161A) to unscrew it from power feed bracket (68A, page 134) and lower telescopic tube assembly onto motor drive bracket (8A, page 132).
2. Remove one screw (117A) from retainer (116A) and replace with an eyebolt. Place a rope or cable sling behind handwheel (69A) around dial (85A) and fasten to a crane. Attach a rope from the eyebolt to the crane and take slack out of rope.
3. Remove 5 cap screws (68A-1) and taper pin (66A) holding power feed bracket (68A) to right side of column. Pull power feed bracket away from column and elevate with crane to remove.

4. Move power feed bracket to a work bench or table. Remove center screw (81A) and pull handwheel with outer clutch (82A) in place from the end of shaft (113A). Through hole in dial (85A) remove threaded pin (73A). Remove plug (77A), set screw (75A) and remove collar (83A), inner clutch (84A) and dial (85A).

5. Remove screw (141A) from plug (142A). Screw a 3/8" - 16 threaded rod mounted with a sliding weight and having a nut on its outer end into plug (142A) and tap it from bracket. Remove bushing (143A) and pinion (144A).
6. Remove 4 screws holding oil sight cover (79A) and remove cover. Remove retainer (116A) from end of bracket. Through oil sight cover opening hold lock collar (95A), turn feed drive shaft (113A) until splines are in line with grooves in lock collar and drive shaft toward rear of bracket far enough to remove snap ring (102A) and pin (94A) from sleeve rack (101A). Loosen set screw, tap to loosen lock shoe and remove lock nut (100A) from threaded portion of shaft (113A). Shaft can now be removed from rear of bracket.

To Remove and Dismantle Vertical Head

1. Break union at top of machine and remove coolant piping from head. Remove top cover plate (250A on page 122). Remove turret stop from right side of head. Remove power feed operating dog from slot on right side of head. Remove arbor draw-in bolt. Release vertical head clamping lever.
2. Raise or lower vertical head until 5/8"-11 tapped hole of steel sleeve in each side of counterweight is in line with hole in column. Screw two-threaded bars into counterweight to lock it in place. Elevate head slightly and free chain from counterweight. Lay chains down over front of head.

Remove snap rings, chain sprockets (266A, 271A) and washers from studs (276A, 279A) at each side of head. (See page 122.) Loosen locking set screws through top of head and pull out studs. Studs are tapped 3/8"-16 to aid removal. Screw a 1/2" eyebolt with a shank 6" long into tapped holes at each side of top of head between ways.

Fasten eyebolts in vertical head to a crane and maintain a slight tension on cables while elevating vertical head by hand until it is free of elevating screw. Remove gib from each side of head, raise head off column and set on its side on a bench. Take chains off head.

3. Remove rear cover (77A, page 144), oil retainer (94A, page 146) and top cover (79A) from rear of vertical head. Remove two 1/4 pipe plugs (57A, page 144) and oil cup from top rear of vertical head. Through top hole loosen set screw in upper lock nut (80A). Tap hexagon key to loosen locking shoe and unscrew upper nut. Through lower pipe plug hole, loosen set screw, and lock shoe in lower bearing nut (83A) (See page 146).

Insert a rod into capstan holes of nut and unscrew. Spline shaft (93A), clutch gear (86A) and sliding gear clutch (89A) can now be slipped out of head. Tap upper bearing cup (82A) from spline shaft bore before assembling. (Page 146)

Remove locking set screw at lower end of shaft (53A), remove shaft and brass sliding gear shifter fork (55A, page 144). Remove cotter key at inside end of back gear lever shaft (6A), left side of head, and remove lever and shifter arm (7A). See page 142.) These parts do not have to be removed unless spindle is to be removed and all should be in place before spline shaft is replaced.

4. Remove bottom (120A, page 146) and top (97A) dust caps from spindle. Top dust cap is held in place by a snap ring and bottom cap by screws.

Remove cap screws from bearing retainer (99A), at top of head. Fasten a steel bar across retainer with two 1/4"—20 cap screws on a 4-5/8" diameter circle. With a bar through spindle, tap retainer and roller bearing cup up out of head. Loosen lock screw, tap to relieve locking shoe, and remove top lock nut (100A) from spindle. Through rear opening tap high speed gear (104A) up off keyway and remove from spindle. Similarly, tap low speed gear (105A) to loosen it from taper on spindle.

Through pipe plug hole on left side of head, loosen set screw in bearing adjusting nut (106A), tap to relieve locking shoe and unscrew nut. Rotate spindle so bearing key (118A) faces rear. Fasten a steel bar across spindle nose with two 1/4"—20 cap screws in bottom dust cap screw holes on a 6-5/16" diameter circle. (This is a safety measure to prevent spindle from falling in case it has become loose in upper bearing.) Lift bearing key out of bearing, remove bar from spindle nose and tap spindle out of head.

When assembling, use same bar across spindle nose to hold spindle in place while upper tapered roller bearing cone, bearing key and adjusting nut are being installed. Remove stationary bar and use a 1" square bar in key slots to pull up adjusting nut.

To Remove Spiral Bevel Gear and Pinion (Vertical Machine)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 3, page 24, under "To Remove Main Drive Bracket"; as per paragraphs 1 through 2, page 33, under "To Remove Vertical Head".
2. Loosen set screw, tap to loosen lock shoe underneath, remove nut (145A) and driven gear (144A) at end of spiral bevel stem pinion. (See page 116.) Loosen adjusting nut (143A) at end of stem pinion. (Gears can be locked together with a copper strip in teeth while loosening these nuts.) Remove cap screws and lift out bearing retainer (129A) with spiral bevel gear (133A) assembly. Remove adjusting nut and tap stem pinion (137A) forward out of its bearings. (A sealing plug will be driven out of casting with pinion.)

Fitting washers (130A and 138A) under gear and pinion were ground to allow .003" to .004" backlash between gears. If gears are replaced with new ones, install original spacers and check backlash. (These gears are lapped together and always supplied as a pair.)

MAINTENANCE HINTS

1. Be certain that all stations are kept properly lubricated in accordance with lubricating instructions.
2. Keep your machine as clean as possible; it pays. Use a stiff bristled brush to remove chips rather than compressed air. An air blast may drive dirt into bearings to cause undue wear. Also, flying chips can be dangerous to fellow workers.
3. Safety stop dogs are provided to disengage power drive to all sliding units. Do not remove these dogs in an effort to obtain more travel, as serious damage to the machine may result if a unit is being power driven when it strikes another unit.
4. The electrical compartment door should never be opened except by an experienced maintenance man for electrical control repair work.
5. Manual handwheels and cranks are provided with springs and positive knockouts to disengage dog clutches during power feed. Do not tamper with these disengaging mechanisms in order to keep a handwheel in engagement, as it may result in serious injury to operator or fellow worker.
6. Do not try to reverse the direction of spindle rotation while it is in motion.
7. The feed change lever on front of knee should not be moved unless all feed levers are in their neutral positions.
8. Check oil supply in arbor support before using. When storing away, invert arbor support and place on a non-metallic surface. If stored away while in an upright position the oil in reservoir continues to drain out.

Below in capital letters are listed problems that may be encountered. Under each are listed—in italics—probable causes and, below, the corrections.

LOW HYDRAULIC OIL PRESSURE

-a-

Oil level in column too low.

Fill and maintain level at bottom of opening.

-b-

Incorrect relief valve setting in column.

Set oil pressure per instructions on page 21.

-c-

Clogged suction line strainer.

Drain column through 1" pipe nipple at right rear of machine under motor cover. Unscrew strainer from right rear of machine, above drain. Clean strainer and scrape out bottom of sloping reservoir before replacing strainer.

-d-

Worn pump gears or broken housing.

Remove pump per instructions in paragraph 2, page 24 and renew necessary parts.

SPEED GEARS FAIL TO SHIFT

-a-

Low hydraulic oil pressure.

Set oil pressure per instructions on page 21.

-b-

Dirt in oil, or a poor grade of oil, that in breaking down, has lodged around relief valve and caused it to stick open.

Remove 1/8" pipe from top center of shifter bracket. Hold a rag loosely over hole and momentarily start machine. The spurt of oil from hole may carry dirt out with it.

Check hydraulic oil pressure per instructions on page 21. If necessary, take off shifter bracket per instructions on page 23, remove relief valve and clean.

Flush column and lines, clean strainer, then keep column reservoir filled only with oil of correct specifications per page 15. Check and set pressure at 200-210 psi.

While shifter bracket is off machine check to see that shifter forks and operating pistons move reasonably free.

SPEED VARIATION FROM ACTUAL DIAL READING

-a-

Dial loose on drum.

Start machine and run spindle at lowest rpm

(lowest and highest speeds are adjacent on dial). Loosen spanner type lock nut and turn dial until it indicates actual spindle speed. Tighten nut.

-b-

Low hydraulic oil pressure.

Reset oil pressure per instructions on page 21.

If oil pressure fails to remain high enough or relief adjusting screw requires more than a slight adjustment, follow instructions under "b" of "Speed Gears Fail to Shift".

TABLE FEED DOES NOT AGREE WITH DIAL SETTING

Dial loose on sleeve.

Start machine and set table at lowest feed rate. (Lowest and highest feed rates are adjacent on dial.) Loosen spanner type lock nut and turn dial until it indicates lowest feed rate. Tighten nut.

FAULTY OPERATION OF MAIN CLUTCH AND SPINDLE BRAKE

-a-

Improper adjustment of drive clutch.

Adjust clutch per instructions on page 18.

-b-

Worn brake plates allow spindle to coast after main clutch is disengaged.

Remove Drive Bracket per instructions on page 24 and remove No. 1 Drive Shaft. Lift off clip ring and slide off spacer and brake plates. With new brake plates in place, the spacer should be ground on a surface grinder so there is .020" clearance between shoulder of hub and inner brake plate.

RAPID TRAVERSE LEVERS DO NOT RETURN TO NEUTRAL POSITION WHEN RELEASED

Disengaging tension spring broken.

Proceed per instructions on page 25, under "To Remove Feed Drive Bracket." Replace spring (218A), page 56.

RAPID TRAVERSE TABLE MOVEMENTS ERRATIC

Table gib setting too tight.

Reset gib per instructions on page 18.

POWER CROSS OR VERTICAL FEED LEVERS HANG UP BEFORE CLUTCH IS ENGAGED WITH RESULTANT CLASHING OF GEARS

Worn detents on control shafting.

Proceed per instructions on page 30, under "To Remove Vertical and Cross Feed Detent Shafts." Insert new detents.

KNEE MOVEMENT DOES NOT COINCIDE WITH DIAL MOVEMENT

Gib setting too tight.

Reset knee gibs per instructions on page 18.

KNEE DROPS FROM DIAL SETTING AFTER IT HAS BEEN MOVED UP OR DOWN

Worn brake shoes on elevating shaft.

Proceed per instructions on page 25, and remove feeddrive bracket from bottom of knee. Remove rear control bracket or rectangular cover from left rear of knee. Unscrew 1/2" set screw, near rear of vertical feed lever, from left side of knee.

Through bottom and side opening, extract cotter key and remove vertical pin from brake on front elevating shaft. Slide brake back along shaft, extract horizontal pin from rear of brake and lift shoes off hub.

When assembling new brake shoes, make certain that set screw engaging slot is down.

KEY NUMBER LOCATION INDEX

Unit Name	Drawing Name	Key Numbers	Page Number	Key Numbers of Drawings of Other units
Shifter Bracket 2JS	Selector Valve	1A - 55A	41	
	Shifter Forks	56A - 111A	43	
	Hydraulic Tubing	112A - 132A	45	
Feed Box - 2JF	Feed Box	1A - 71A	47	
Knee - 2JK	Knee and Covers	1A - 69A	49	
	Cross Feed Screw	70A - 110A		
		670A - 677A	51	
	Elevating Shaft	111A - 149A	53	
	Cross Feed Control	150A - 194A	55	
	Rapid Traverse Control	195A - 229A	57	
	Vertical Feed Control	230A - 267A		
	Feed Dial	268A - 291A	59	
	Safety Gear Shaft	292A - 341A	61	
	Rapid Traverse Clutch	342A - 385A	63	
	Spline Shaft	386A - 400A		
	Elevating Pinion	401A - 418A	65	
	Idler Gears	419A - 440A		
	Motor Drive	441A - 504A	67	
	Rear Control Bracket	505A - 562A	69	
	Elevating Screw	578A - 584A	71	2JC-563A thru 577A, 2JC-585A thru 587A
	Hydraulic Pump	588A - 623A		
Saddle Table 2JH	Skinner Filter	624A - 628A	73	
	Hydraulic Tubing	629A - 645A		
	Lubrication Tubing	646A - 667A	75	
	Bracket Under Saddle	1A - 47A	77	
	Saddle and Linkage	48A - 131A	79	
	Leadscrew Clutch	132A - 182A	81	
	Universal Saddle	183A - 214A	83	
	Universal Housing	215A - 270A	85	
	Control Linkage	271A - 319A	87	
	Short Lead Attachment	320A - 339A		
	Backlash Eliminator	340A - 360A	89	
	Table, Leadscrew, and Backlash Nuts	361A - 388A	91	
	Table Aprons	389A - 431A	93	
	Table Dogs, Without Automatic Table Cycle	432A - 443A		
	Table Dogs, With Automatic Table Cycle	444A - 476A	95	
	Automatic Table Cycle Valve	477A - 504A		
	Saddle Table Lubrication	505A - 537A	97	
	Saddle Table Lubrication	538A - 568A	99	
	Saddle Table Lubrication	569A - 629A	101	
	Saddle Table Lubrication	630A - 672A	103	

KEY NUMBER LOCATION INDEX (Continued)

Unit Name	Drawing Name	Key Numbers	Page Number	Key Numbers of Drawings of Other Units
Motor Drive-2JN	Motor Drive	1A - 23A	105	
Drive Bracket 2JBM	Drive Bracket	1A - 64A	107	
	Clutch	65A - 127A	109	2JN-103A, 110A, 111A
Column - 2JC	Column and Covers	1A - 69A	111	
	Horizontal Spindle	70A - 94A	113	
	Back Gear Shaft	95A - 113A	115	
	Pump Drive Shaft	114A - 123A		
	Vertical Drive Shafts	124A - 158A	117	
	Overarm and Arbor Supports	159A - 206A	119	
	Control Levers	207A - 244A	121	
	Vertical Head Counterweight and Guides	245A - 298A	123	
	Feed Control Valve	299A - 330A	125	
	Spindle Stop Valve	331A - 364A	127	
	Column Tubing	365A - 392A	129	
	Column Tubing	393A - 427A	131	
Feed to Vertical Head - 2JAJ	Drive from Knee	1A - 46A	133	
	Upper Bracket	47A - 118A	135	
	Shifting Linkage Telescopic Tubes	119A - 161A	137	
	Hand Feed Bracket	162A - 202A	139	
Turret Stop 2JAR	Turret and Micrometer Stops	1A - 36A	141	2JAJ-203A thru 211A
Vertical Head 2JDV	Shifter Control and Oil Gages	1A - 36A	143	
	Vertical Head Feed Screw and Pump	37A - 77A	145	2JAJ-60A, 61A, 63A, 67A, 70A, 71A, 72A, 74A, 2JC-450A thru 465A
	Vertical Spindle and Back Shaft	78A - 121A	147	
Coolant - 2JP	Coolant Supply	1A - 29A	149	2JN-30A, 31A
	Coolant Supply	32A - 52A	151	2JN-53A, 54A
Instruction Plates		1A - 16A	153	

HOW TO ORDER REPAIR PARTS

You will receive quicker and better service when ordering repair parts if you will adhere to the following instructions when ordering such replacements.

These four requirements are essential:

1. State amount wanted.
2. Give catalog key number, part number and name of part. In ordering parts of part number, please advise where the number was obtained. (See paragraph A, below.)
3. Give complete serial number of machine. It is stamped on right front of table and top front of column - figures 4B and 8B.
4. Specify how and where to ship. (See paragraph B, below.)

PARAGRAPH A

When ordering parts by number, kindly advise how the number was obtained, namely:

Number stamped on part.

Prior Invoice.

Parts List Catalog. (Give identification and publication numbers on front cover.)

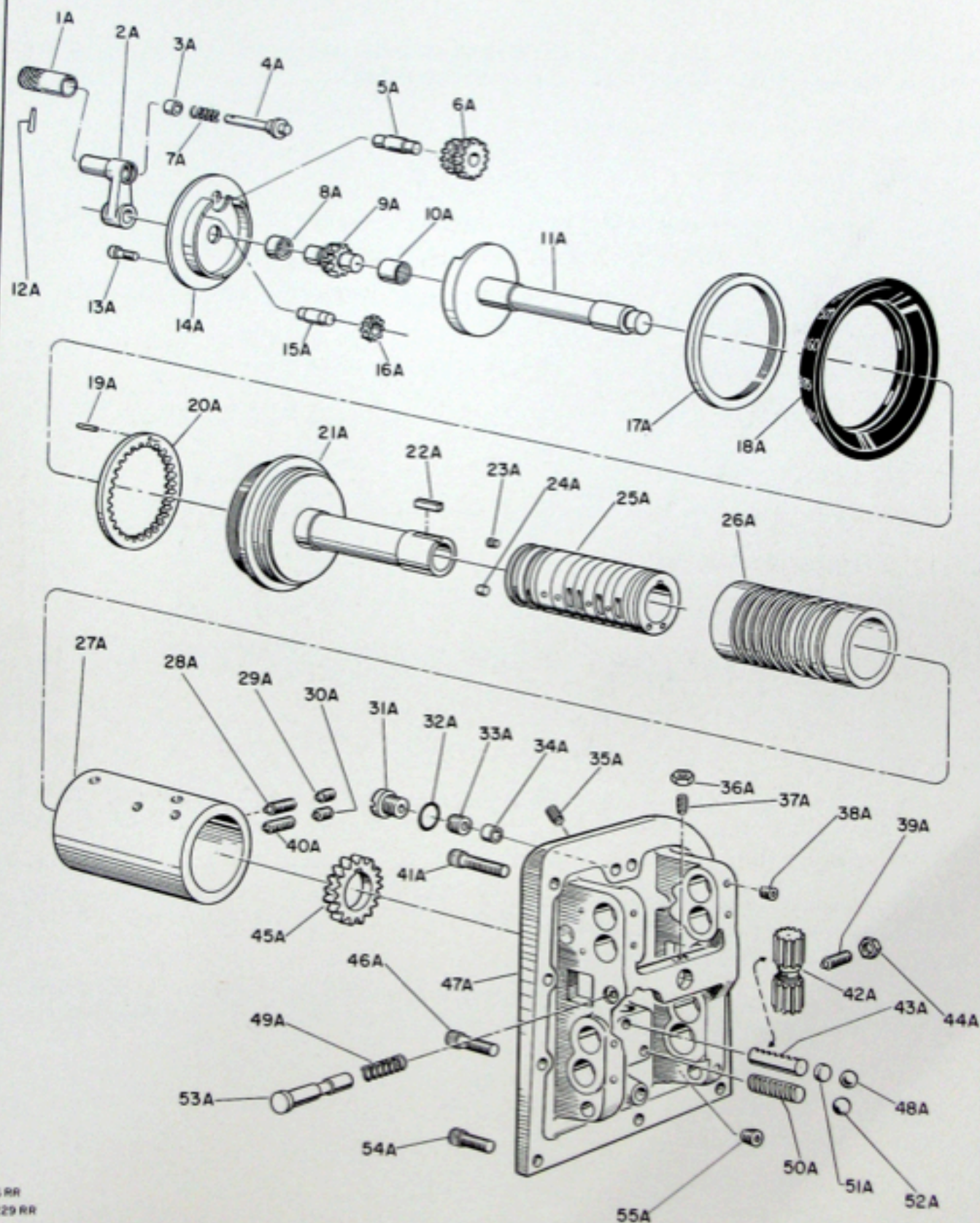
PARAGRAPH B

Do not say, "Ship quickest way." Be definite and state agency desired, that is - Air Mail, Parcel Post (Special Delivery), Parcel Post (Regular), Express, Motor Freight, Rail Freight, etc.

Specify each individual piece that is required in the order. If only certain parts of a unit are required, never use the word "complete"; it always raises a question as to how much of a unit to supply.

However, in some cases, due to the nature of the part, it will be necessary and less costly to you, for us to supply additional related pieces, especially if part wanted is obsolete.

SELECTOR VALVE



6 RR
229 RR

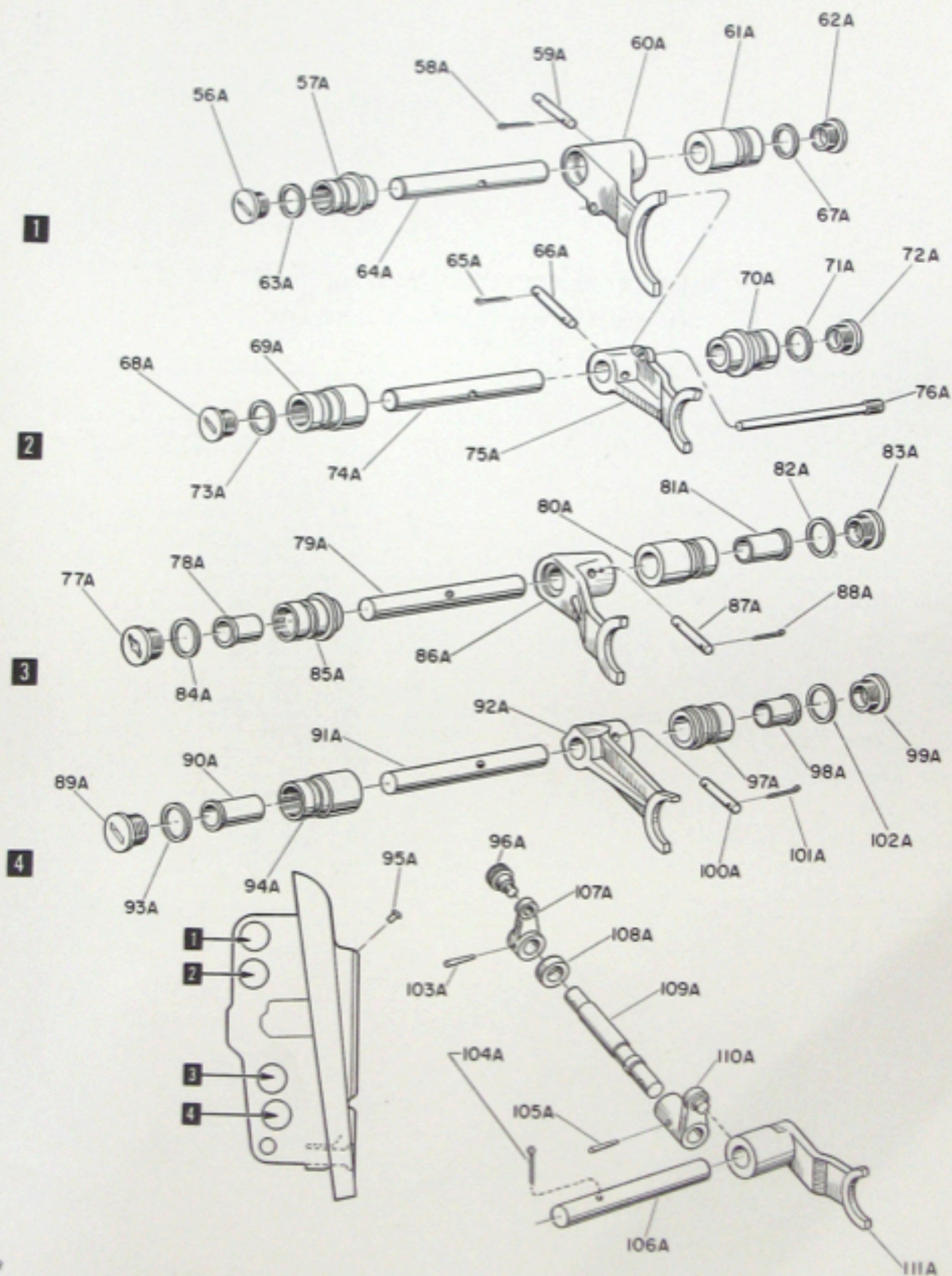
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SHIFTER BRACKET — UNIT No. 2JS 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JS-1A	112838	Handle - Speed Change	1	2JS-26A	124235	Bushing - Selector Valve	1
2JS-2A	111251	Lever - Index	1	2JS-27A	124236	Sleeve - Selector Valve - Outer	1
2JS-3A	106992	Bushing	1	2JS-28A	3236	Screw - Set	1
2JS-4A	115252	Plunger - Index	1	2JS-29A	3232	Screw - Set	1
2JS-5A	111247	Shaft-Idler Gear	1	2JS-30A	3232	Screw - Set	1
2JS-6A	111245	Gear - Compound Idler	1	2JS-31A	137473	Screw - Pipe Thread	1
2JS-7A	253	Spring	1	2JS-32A	244156	Ring - "O"	1
2JS-8A	79525	Bearing - Needle	1	2JS-33A	108487	Screw - Stuffing Box	1
2JS-9A	113461	Gear - Index Lever	1	2JS-34A	66375	Packing - Stuffing Box	1
2JS-10A	76357	Bearing - Needle	1	2JS-35A	3239	Screw - Set	1
2JS-11A	113462	Shaft - Selector Valve Sleeve	1	2JS-36A	664	Nut - Hex	3
2JS-12A	2291	Pin - Taper	1	2JS-37A	3234	Screw - Set	3
2JS-13A	3101	Screw	3	2JS-38A	76644	Plug - Pipe	5
2JS-14A	112846	Plate - Index	1	2JS-39A	3235	Screw - Set	1
2JS-15A	113459	Shaft - Idler Gear	1	2JS-40A	3236	Screw - Set	1
2JS-16A	113460	Gear - Idler	1	2JS-41A	3163	Screw	4
2JS-17A	111252	Nut - Speed Dial	1	2JS-42A	113959	Pinion - Interlock	1
2JS-18A		Dial - Speed	1	2JS-43A	115974	Rack - Interlock	1
	158038	Plain and Universal Machines 25-1500	1	2JS-44A	664	Nut - Hex	1
	158043	Plain and Universal Machines 20-1200	1	2JS-45A	111242	Detent - Valve	1
	158044	Plain and Universal Machines 33-2000	1	2JS-46A	3248	Screw	2
	158046	Vertical Machines 25-1500	1	2JS-47A	125616	Bracket - Gear Shifter	1
	158045	Vertical Machines 20-1200	1	2JS-48A	36147	Ball - Steel	1
	158047	Vertical Machines 33-2000	1	2JS-49A	71272	Spring - Plunger	1
2JS-19A	3383	Pin	1	2JS-50A	115974	Rack - Interlock	1
2JS-20A	111248	Gear - Internal	1	2JS-51A	115975	Washer - Brass	1
2JS-21A	125617	Sleeve - Selector Valve	1	2JS-52A	36147	Ball - Steel	1
2JS-22A	1632	Key	1	2JS-53A	111243	Plunger - Valve Detent	1
2JS-23A	4236	Plug - Pipe	2	2JS-54A	3343	Screw	3
2JS-24A	1844	Plug	1	2JS-55A	221981	Plug - Pipe	1
2JS-25A	124234	Valve - Selector	1				

SHIFTER FORKS



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

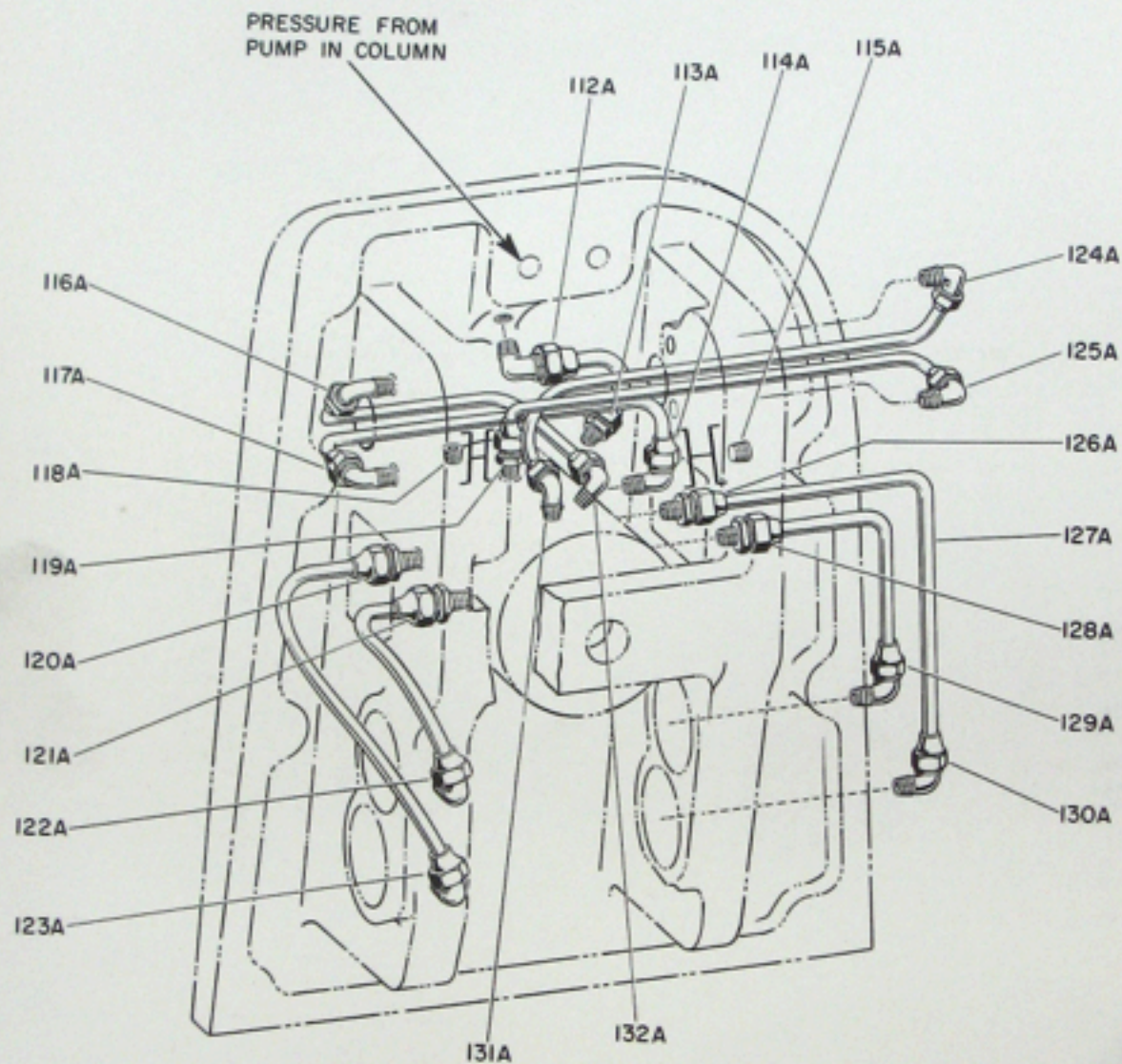
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SHIFTER BRACKET — UNIT No. 2JS (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JS-56A	111271	Plug - Cylinder	1	2JS-79A	111263	Piston - Primary Gear Shift	1
2JS-57A	111269	Cylinder - Secondary Gear Shift	1	2JS-80A	111258	Cylinder - Primary Gear Shift	1
2JS-58A	2095	Pin - Cotter	2	2JS-81A	111259	Sleeve - Primary Gear Shift	1
2JS-59A	108688	Pin - Straight	1	2JS-82A	66920	Gasket	1
2JS-60A	116452	Fork - Upper Secondary Gear	1	2JS-83A	111262	Plug - Cylinder	1
2JS-61A	111270	Cylinder - Secondary Gear Shift	1	2JS-84A	66920	Gasket	1
2JS-62A	111271	Plug - Cylinder	1	2JS-85A	111257	Cylinder - Primary Gear Shift	1
2JS-63A	61181	Gasket	1	2JS-86A	123330	Fork - Upper Primary Gear	1
2JS-64A	111267	Piston - Upper	1	2JS-87A	123327	Pin - Straight	1
2JS-65A	2095	Pin - Cotter (Plain and Universal Machines Only)	2	2JS-88A	2095	Pin - Cotter	1
2JS-66A	108688	Pin - Straight (Plain and Universal Machines Only)	1	2JS-89A	111262	Plug - Cylinder	1
2JS-67A	61181	Gasket	1	2JS-90A	111259	Sleeve - Primary Gear Shift	1
2JS-68A	111271	Plug - Cylinder (Plain and Universal Machines Only)	1	2JS-91A	111263	Piston - Primary Gear Shift	1
2JS-69A	111268	Cylinder - Secondary Gear Shift (Plain and Universal Machines Only)	1	2JS-92A	123329	Fork - Lower Primary Gear	1
2JS-70A	111269	Cylinder - Secondary Gear Shift (Plain and Universal Machines Only)	1	2JS-93A	66920	Gasket	1
2JS-71A	61181	Gasket (Plain and Universal Machines Only)	1	2JS-94A	111258	Cylinder - Primary Gear Shift	1
2JS-72A	111271	Plug - Cylinder (Plain and Universal Machines Only)	1	2JS-95A	108760	Button - Speed Dial	1
2JS-73A	61181	Gasket (Plain and Universal Machines Only)	1	2JS-96A	112632	Screw - Reverse Lever	1
2JS-74A	111266	Piston - Lower (Plain and Universal Machines Only)	1	2JS-97A	111257	Cylinder - Primary Gear Shift	1
2JS-75A	116453	Fork - Lower Secondary Gear (Plain and Universal Machines Only)	1	2JS-98A	111260	Sleeve - Primary Gear Shift	1
2JS-76A	111272	Pin - Shifter Fork Aligning (Plain and Universal Machines Only)	1	2JS-99A	66920	Gasket	1
2JS-77A	111261	Plug - Cylinder	1	2JS-100A	123327	Pin - Straight	1
2JS-78A	111260	Sleeve - Primary Gear Shift	1	2JS-101A	2095	Pin - Cotter	1
				2JS-102A	111261	Plug - Cylinder	1
				2JS-103A	663	Pin - Taper	1
				2JS-104A	1333	Pin - Cotter	1
				2JS-105A	663	Pin - Taper	1
				2JS-106A	111255	Shaft - Reverse Gear Shift	1
				2JS-107A	112631	Lever - Reverse	1
				2JS-108A	225409	Seal - Oil	1
				2JS-109A	112839	Shaft - Reverse Lever	1
				2JS-110A	114232	Shifter - Reverse Gear Fork	1
				2JS-111A	111256	Fork - Reverse Gear	1

HYDRAULIC TUBING



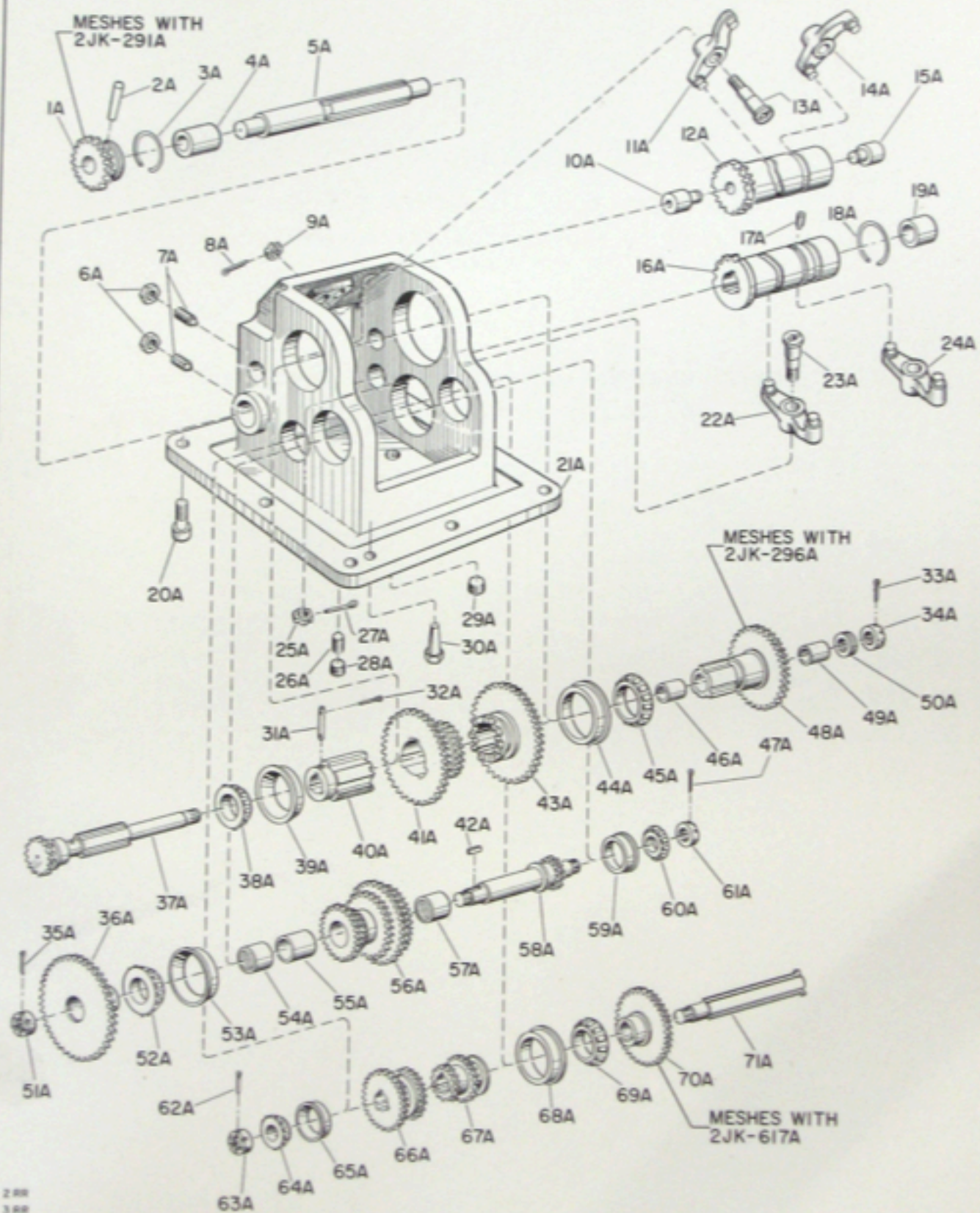
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SHIFTER BRACKET — UNIT No. 2JS (Concluded) 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JS-112A	4013	Fitting - Tubing - Elbow	1	2JS-123A	58152	Fitting - Tubing - Elbow	1
2JS-113A	70382	Fitting - Tubing	1	2JS-124A	58152	Fitting - Tubing - Elbow	1
2JS-114A	58152	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1	2JS-125A	58152	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1
2JS-115A	76644	Plug - Pipe (2MI Vertical Machines Only)	1	2JS-126A	89866	Fitting - Tubing	1
2JS-116A	58152	Fitting - Tubing - Elbow	1	2JS-127A		Tubing List	1
2JS-117A	58152	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1		111238	Plain and Universal Machines	1
2JS-118A	76644	Plug - Pipe (2MI Vertical Machines Only)	1		114231	2MI Vertical Machines	1
2JS-119A	89866	Fitting - Tubing (Plain and Universal Machines Only)	1	2JS-128A	89866	Fitting - Tubing	1
2JS-120A	89866	Fitting - Tubing	1	2JS-129A	58152	Fitting - Tubing - Elbow	1
2JS-121A	89866	Fitting - Tubing	1	2JS-130A	58152	Fitting - Tubing - Elbow	1
2JS-122A	58152	Fitting - Tubing - Elbow	1	2JS-131A	58152	Fitting - Tubing - Elbow	1
				2JS-132A	58152	Fitting - Tubing - Elbow	1

FEED BOX



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

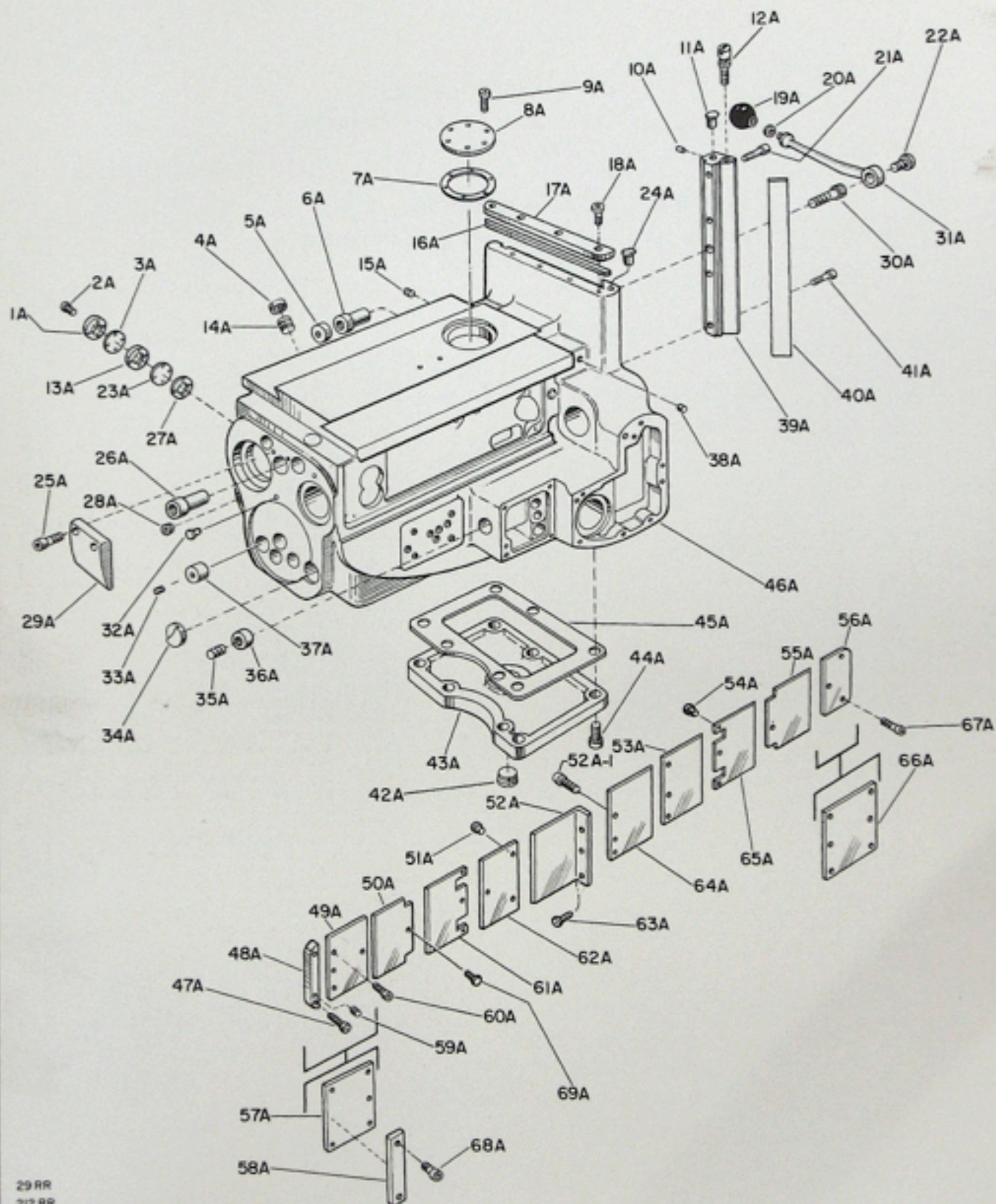
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

FEED BOX — UNIT No. 2JF

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JF-1A	114199	Gear - Primary Cam Driver	1	2JF-38A	111030	Cone - Bearing	1
2JF-2A	143	Pin - Taper	1	2JF-39A	98776	Cup - Bearing	1
2JF-3A	45322	Ring - Split	1	2JF-40A	111007	Clutch - Third Feed Shaft	1
2JF-4A	111326	Bushing - Primary Cam Shaft - Long	1	2JF-41A	111018	Gear - Sliding - Third Feed Shaft	1
2JF-5A	115436	Shaft - Primary Cam	1	2JF-42A	345	Key - Square	1
2JF-6A	3472	Nut - Hex	4	2JF-43A	111017	Gear - Clutch - Third Feed Shaft	1
2JF-7A	3230	Screw - Set	4	2JF-44A	74228	Cup - Bearing	1
2JF-8A	1987	Pin - Cotter	2	2JF-45A	72994	Cone - Bearing	1
2JF-9A	79859	Nut - Slotted	2	2JF-46A	111023	Bushing - Third Feed Shaft	1
2JF-10A	113961	Stud - Secondary Cam	1	2JF-47A	3379	Pin - Cotter	1
2JF-11A	111006	Lever - "D" - Secondary Cam	1	2JF-48A	111012	Gear - Spline - Third Feed Shaft	1
2JF-12A	115407	Cam - Secondary	1	2JF-49A	111023	Bushing - Third Feed Shaft	1
2JF-13A	111020	Stud - Cam Lever	2	2JF-50A	96078	Bearing - Thrust	1
2JF-14A	111005	Lever - "C" - Secondary Cam	1	2JF-51A	111025	Nut - Slotted	1
2JF-15A	113961	Stud - Secondary Cam	1	2JF-52A	95585	Cone - Bearing	1
2JF-16A	115408	Cam - Primary	1	2JF-53A	95586	Cup - Bearing	1
2JF-17A	3229	Screw	1	2JF-54A	98840	Bearing - Needle	1
2JF-18A	70754	Ring - Split	1	2JF-55A	111029	Spacer	1
2JF-19A	111027	Bushing - Primary Cam - Short	1	2JF-56A	111014	Gear - Multiple - Second Feed Shaft	1
2JF-20A	3403	Screw	8	2JF-57A	98840	Bearing - Needle	1
2JF-21A	113962	Box - Feed	1	2JF-58A	111015	Shaft - Second Feed Pinion	1
2JF-22A	111004	Lever - "B" - Primary Cam	1	2JF-59A	78732	Cup - Bearing	1
2JF-23A	111020	Stud - Cam Levers	2	2JF-60A	78731	Cone - Bearing	1
2JF-24A	111004	Lever - "A" - Primary Cam	1	2JF-61A	111025	Nut - Slotted	1
2JF-25A	79859	Nut - Slotted	2	2JF-62A	3379	Pin - Cotter	1
2JF-26A	116469	Screw - Cone Point Set	1	2JF-63A	111025	Nut - Slotted	1
2JF-27A	1987	Pin - Cotter	2	2JF-64A	78731	Cone - Bearing	1
2JF-28A	76645	Plug - Pipe	1	2JF-65A	78732	Cup - Bearing	1
2JF-29A	220784	Plug - Pipe	1	2JF-66A	111011	Gear - Large Sliding	1
2JF-30A	11643	Pin - Taper	2	2JF-67A	111009	Gear - Small Sliding	1
2JF-31A	111024	Pin - Straight	1	2JF-68A	95586	Cup - Bearing	1
2JF-32A	3329	Pin - Cotter	2	2JF-69A	95585	Cone - Bearing	1
2JF-33A	3379	Pin - Cotter	1	2JF-70A		Gear - First Shaft Driver	1
2JF-34A	111025	Nut - Slotted	1		111010	1/4 - 30 Feed	1
2JF-35A	3379	Pin - Cotter	1		116061	1/2 - 60 Feed	1
2JF-36A	111013	Gear - Large - Secondary Feed Shaft	1	2JF-71A	111019	Shaft - First Feed	1
2JF-37A	116439	Shaft - Third Feed	1				

KNEE AND COVERS



29 RR
212 RR
445 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

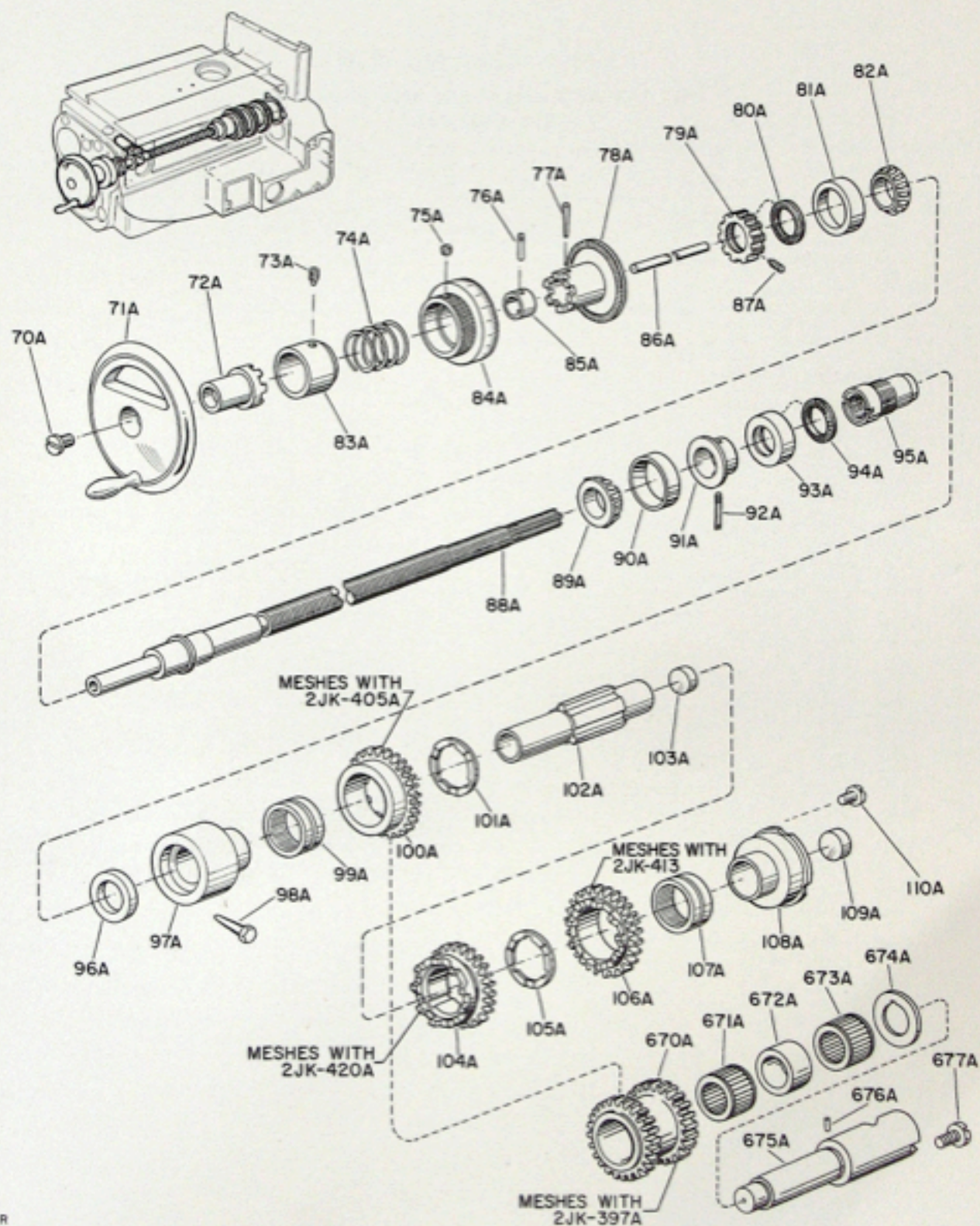
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-1A	4076	Cover - Oil Gage	1	2JK-38A	3529	Plug	2
2JK-2A	3197	Screw	4	2JK-39A		Guide - Knee	
2JK-3A	4078	Disc - Oil Gage	1		112875	2MI, 2ML Machines	1
2JK-4A	74312	Cap - Oil Filler	1		112897	3MI Machines	1
2JK-5A	3552	Plug	1	2JK-40A		Gib - Guide	
2JK-6A	111427	Nut - Clamp	1		111443	2MI, 2ML Machines	1
2JK-7A		Gasket - Elevating Screw Cover			112878	3MI Machines	1
	111430	2MI, 2ML Machines	1	2JK-41A	1925	Screw (2MI, 2ML Machines Only)	3
	114122	3MI Machines	1	2JK-42A	220784	Plug - Pipe	1
2JK-8A		Cover - Elevating Screw		2JK-43A		Cover - Bottom	
	116361	2MI, 2ML Machines	1		137540	2MI, 2ML Machines	1
	114121	3MI Machines	1		114157	3MI Machines	1
2JK-9A	3198	Screw	6	2JK-44A		Screw	
2JK-10A	1844	Plug	1		3399	2MI, 2ML Machines	7
2JK-11A	83512	Oil	1		3399	3MI Machines	10
2JK-12A	63606	Screw - Gib	1	2JK-45A		Gasket - Cover	
2JK-13A	4087	Gasket - Oil Gage	1		111441	2MI, 2ML Machines	1
2JK-14A	3912	Nipple	1		114158	3MI Machines	1
2JK-15A	3233	Screw	1	2JK-46A		Knee	
2JK-16A		Wiper - Knee			161931	2MI, 2ML Plain and Universal Machines	1
	111429	2MI, 2ML Machines	1		161958	2MI Vertical Machines	1
	112879	3MI Machines	1		156576	3MI Machines	1
2JK-17A		Wiper - Knee		2JK-47A	3396	Screw - (2MI, 2ML Machines Only)	2
	111442	2MI, 2ML Machines	1	2JK-48A	118308	Stop - Sliding Plate (2MI, 2ML Machines)	1
	112879	3MI Machines	1	2JK-49A	116385	Plate - Fixed - (2MI, 2ML Machines)	1
2JK-18A	3213	Screw	4	2JK-50A	121156	Plate - Fourth Front Sliding	1
2JK-19A	3859	Ball - Handle	1	2JK-51A	118309	Pin - Stop	4
2JK-20A	2135	Washer - Lock	1	2JK-52A		Plate - First Front Sliding	
2JK-21A		Screw			118301	2MI, 2ML Machines	1
	3268	2MI, 2ML Machines	2		134212	3MI Machines	1
	1930	3MI Machines	4	2JK-52A-1	3198	Screw	3
2JK-22A	2054	Screw - Hex Head	1	2JK-53A	118306	Plate - Third Rear Sliding	1
2JK-23A	96451	Dial - Oil Gage	1	2JK-54A	118309	Pin - Stop	4
2JK-24A	83512	Oil	1	2JK-55A	118304	Plate - First Rear Sliding	1
2JK-25A	3396	Screw	2	2JK-56A	116389	Plate - Fixed Rear (2MI, 2ML Machines Only)	1
2JK-26A	140412	Baffle - Air Vent	1	2JK-57A	134207	Plate - Fixed Front (3MI Machines Only)	1
2JK-27A	4077	Gasket - Oil Gage	1	2JK-58A	134206	Stop - Sliding Plate (3MI Machines Only)	1
2JK-28A	76645	Plug - Pipe	1	2JK-59A	3230	Screw (2MI, 2ML Machines Only)	1
2JK-29A	138976	Cover - Air Vent - Front	1	2JK-60A	3198	Screw	4
2JK-30A		Screw - Knee Guide Clamp		2JK-61A	118303	Plate - Third Front Sliding	1
	112876	2MI, 2ML Machines	1	2JK-62A		Plate - Second Front Sliding	
	112860	3MI Machines	1		118302	2MI, 2ML Machines	1
2JK-31A	112861	Lever - Clamp	1		134211	3MI Machines	1
2JK-32A	108760	Button - Zero - Speed Dial	1	2JK-63A	3203	Screw	3
2JK-33A	1911	Screw	1	2JK-64A		Plate - Front Rear Sliding	
2JK-34A		Plug			118307	2MI, 2ML Machines	1
	121840	2MI, 2ML Machines	1		134213	3MI Machines	1
	134478	3MI Machines	1	2JK-65A	118305	Plate - Second Rear Sliding	1
2JK-35A	1911	Screw	1	2JK-66A	134214	Plate - Fixed Rear (3MI Machines Only)	1
2JK-36A		Plug		2JK-67A	3198	Screw	2
	3827	2MI, 2ML Machines	1	2JK-68A	3396	Screw (3MI Machines Only)	2
	3962	3MI Machines	1	2JK-69A	116383	Pin - Sliding Plate Guide	8
2JK-37A	3552	Plug	1				

CROSS FEED SCREW



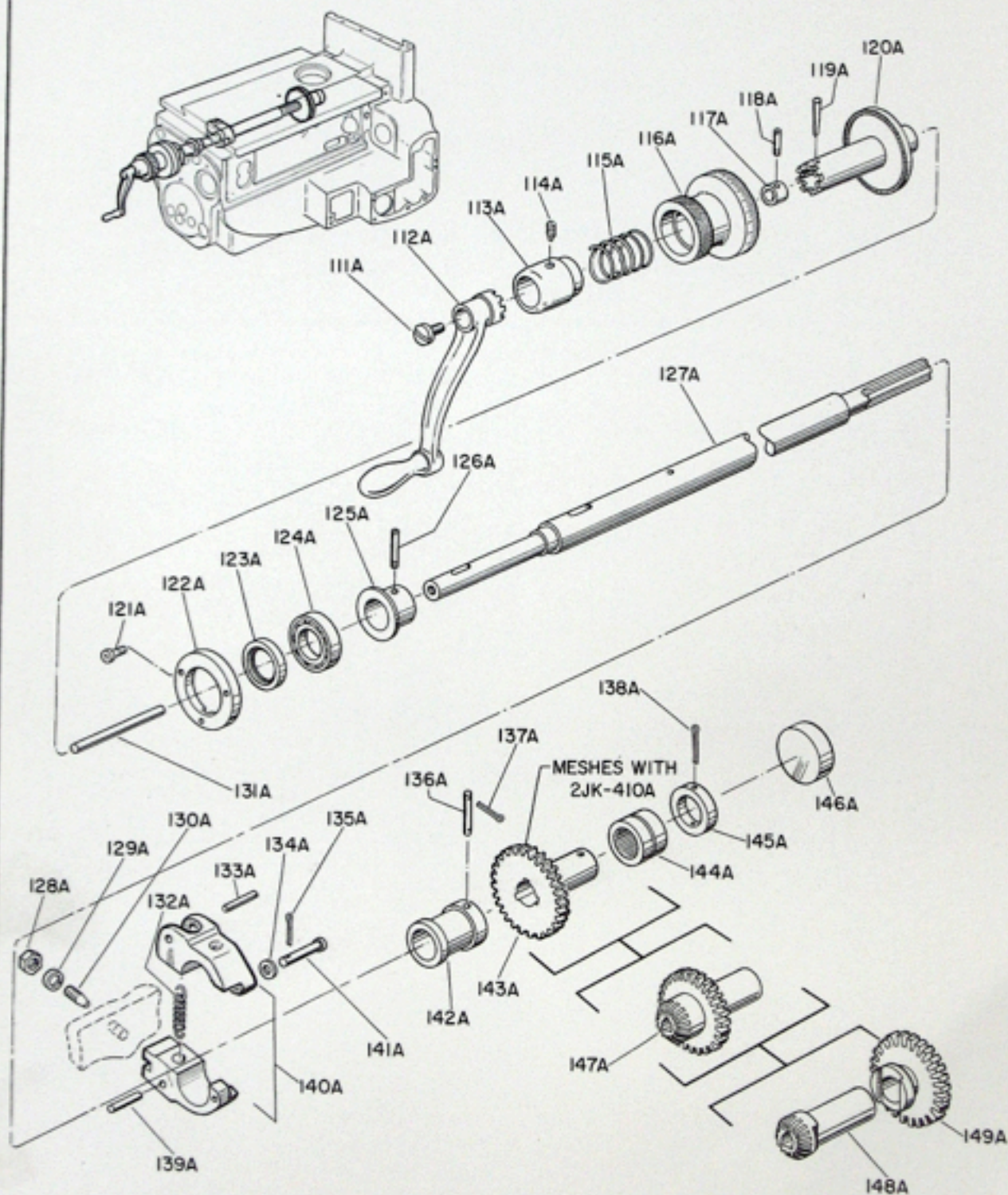
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued) 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-70A	3514	Screw - Retaining	1	2JK-94A	3290	Ring - Felt	1
2JK-71A		Handwheel		2JK-95A	111462	Nut - Cross Feed	1
	161093	2MI, 2ML Machines	1	2JK-96A	93236	Seal - Oil	1
	161083	3MI Machines	1	2JK-97A	116369	Bushing - Cross Feed - Front	1
2JK-72A	161090	Clutch - Handwheel	1	2JK-98A	83432	Pin - Hex Head Taper	1
2JK-73A	3232	Screw - Set	1	2JK-99A	111121	Bearing - Needle	1
2JK-74A	102083	Spring	1	2JK-100A		Gear - Cross Feed	
2JK-75A	102852	Plug	1		111170	2MI, 2ML Machines	1
2JK-76A	66254	Pin - Collar	1		114103	3MI Machines	1
2JK-77A	642	Pin - Taper	1	2JK-101A	131980	Washer	1
2JK-78A	115201	Clutch - Cross Feed Dial	1	2JK-102A	114230	Sleeve - Cross Screw	1
2JK-79A	111467	Nut - Bearing Retainer	1	2JK-103A	73581	Plug	1
2JK-80A	3290	Ring - Felt	1	2JK-104A		Clutch - Cross Feed	
2JK-81A	75710	Cup - Bearing	1		111171	2MI, 2ML Machines	1
2JK-82A	75711	Cone - Bearing	1		114104	3MI Machines	1
2JK-83A	111464	Bushing - Spring Retainer	1	2JK-105A	131980	Washer	1
2JK-84A	115203	Dial - Cross Feed	1	2JK-106A		Gear - Cross Feed	
2JK-85A	66249	Collar - Small	1		111170	2MI, 2ML Machines	1
2JK-86A	116380	Rod - Knockout - Cross	1		114103	3MI Machines	1
2JK-87A	3230	Screw - Set	1	2JK-107A	111121	Bearing - Needle	1
2JK-88A		Screw - Cross		2JK-108A	116370	Bushing - Cross Feed Gear	1
	116433	2MI, 2ML Plain and Universal Machines	1	2JK-109A	40226	Plug	1
	118343	2MI Vertical Machines	1	2JK-110A	104202	Screw	1
	128664	3MI Machines	1	2JK-670A	111188	Gear - Idler	1
2JK-89A	75711	Cone - Bearing	1	2JK-671A	111137	Bearing - Needle	1
2JK-90A	75710	Cup - Bearing	1	2JK-672A	111143	Spacer - Idler Gear	1
2JK-91A	116429	Collar - Knockout - Cross Screw	1	2JK-673A	111137	Bearing - Needle	1
2JK-92A	121532	Pin - Collar	1	2JK-674A	122764	Washer	1
2JK-93A		Retainer - Seal		2JK-675A	111089	Shaft - Idler Gear	1
	116431	2MI, 2ML Machines	1	2JK-676A	3636	Pin - Straight	1
	128500	3MI Machines	1	2JK-677A	104202	Screw - Stud	1

ELEVATING SHAFT



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

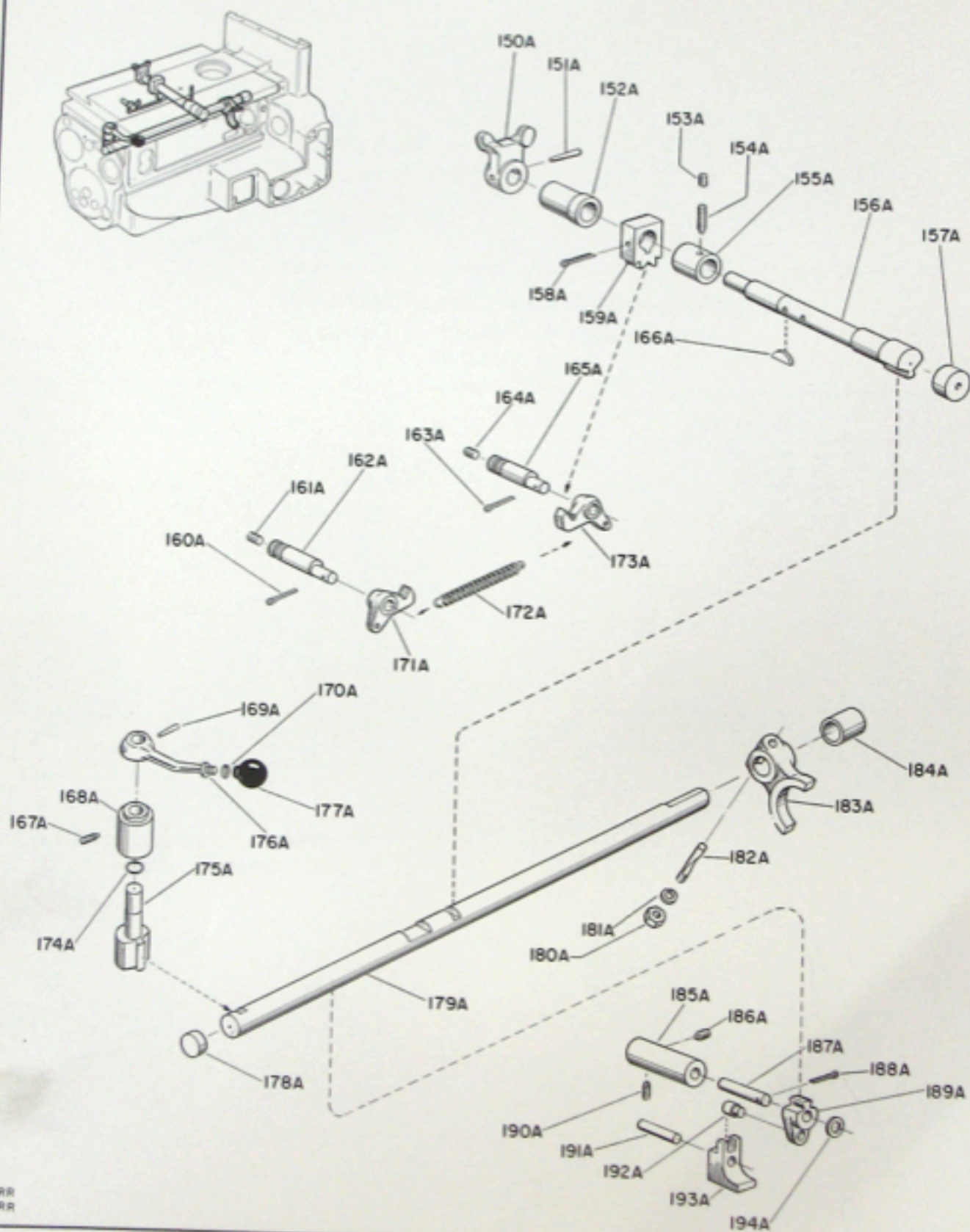
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-111A	3514	Screw - Retaining	1	2JK-132A	72535	Spring	1
2JK-112A	161089	Crank - Elevating	1	2JK-133A	3277	Pin - Straight	1
2JK-113A	108442	Sleeve - Crank	1	2JK-134A	106592	Washer	1
2JK-114A	3232	Screw - Set	1	2JK-135A	3329	Pin - Cotter	1
2JK-115A	102083	Spring	1	2JK-136A	123653	Pin - Straight	1
2JK-116A	115206	Dial - Elevating	1	2JK-137A	3329	Pin - Cotter	2
2JK-117A	66249	Collar	1	2JK-138A	2082	Pin - Cotter	1
2JK-118A	66254	Pin - Collar	1	2JK-139A	3277	Pin - Straight	1
2JK-119A	663	Pin - Taper	1	2JK-140A	123656	Brake - Elevating Shaft	1
2JK-120A	115205	Clutch - Elevating Dial	1	2JK-141A	123654	Pin - Brake	1
2JK-121A	3218	Screw	1	2JK-142A	124186	Spool - Brake	1
2JK-122A	111471	Retainer - Bearing	1	2JK-143A		Gear - Hand Elevating (Without Rear Controls)	
2JK-123A	93235	Seal - Oil	1		111186	2MI, 2ML Machines	1
2JK-124A	90830	Bearing - Ball	1		114097	3MI Machines	1
2JK-125A	115347	Collar - Knockout	1	2JK-144A	108525	Bearing - Needle	1
2JK-126A	121549	Pin - Collar	1	2JK-145A	111164	Collar - Hand Elevating Gear	1
2JK-127A		Shaft - Front Elevating		2JK-146A	3556	Plug	1
	123660	2MI, 2ML Plain and Universal Machines	1	2JK-147A	111452	Gear - Rear Elevating Control (2MI, 2ML With Rear Controls)	1
	124230	2MI Vertical Machines	1	2JK-148A	142824	Gear - Bevel (3MI With Rear Controls)	1
	112872	3MI Machines	1	2JK-149A	147123	Gear - Rear Control (3MI With Rear Controls)	
2JK-128A	3474	Nut - Hex	1				
2JK-129A	2038	Washer - Lock	1				
2JK-130A	123655	Screw - Set	1				
2JK-131A	116381	Rod - Knockout - Elevating	1				

CROSS FEED CONTROL

155RR
165RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued) 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-150A	111768	Dog - Lever - Cross Feed	1	2JK-175A	114164	Shifter - Front Cross Feed	1
2JK-151A	642	Pin - Taper	1	2JK-176A	142671	Lever - Front Cross Feed	1
2JK-152A		Bushing - Cross Shifter Shaft	1	2JK-177A	115032	Ball - Handle	1
	116406	2MI, 2ML Machines	1	2JK-178A	30715	Plug	1
	128599	3MI Machines	1	2JK-179A		Rod - Shifter - Cross	1
2JK-153A	3211	Screw - Set	1		116394	2MI, 2ML Plain and Universal Machines	1
2JK-154A	3237	Screw	1		118346	2MI Vertical Machines	1
2JK-155A	116408	Bushing - Shifter Shaft	1		112873	3MI Machines	1
2JK-156A		Shaft - Cross Feed Shifter	1	2JK-180A	2144	Nut - Hex	1
	116405	2MI, 2ML Machines	1	2JK-181A	2135	Washer - Lock	1
	128522	3MI Machines	1	2JK-182A		Bolt - Clamp	1
2JK-157A	3552	Plug	1		33951	2MI, 2ML Machines	1
2JK-158A	1987	Pin - Cotter	1		33942	3MI Machines	1
2JK-159A	111764	Detent - Control Rod	1	2JK-183A		Fork - Gear Shift - Cross	1
2JK-160A	2095	Pin - Cotter	1		124680	2MI, 2ML Machines	1
2JK-161A	1911	Screw	1		128641	3MI Machines	1
2JK-162A	111772	Stud - Detent Lever	1	2JK-184A	114193	Bushing - Shifter Rod	1
2JK-163A	2095	Pin - Cotter	1	2JK-185A	113495	Bushing - Feed Control	1
2JK-164A	1911	Screw	1	2JK-186A	1911	Screw - Set	1
2JK-165A	111772	Stud - Detent Lever	1	2JK-187A	113494	Pin - Cross Knockout	1
2JK-166A	3280	Key - Woodruff	1	2JK-188A	2095	Pin - Cotter	1
2JK-167A	3232	Screw - Set	1	2JK-189A		Trip - Cross Control Shaft	1
2JK-168A	114166	Bushing - Front Cross Shifter Shaft	1		116378	2MI, 2ML Machines	1
2JK-169A	642	Pin - Taper	1		113493	3MI Machines	1
2JK-170A	2135	Washer - Lock	1	2JK-190A	2233	Screw - Set	1
2JK-171A	98832	Lever - Detent	1	2JK-191A	225056	Pin	1
2JK-172A	127893	Spring - Tension	1	2JK-192A	113497	Pin - Knockout Trip	1
2JK-173A	98832	Lever - Detent	1	2JK-193A	113496	Shifter - Knockout - Cross	1
2JK-174A	247090	Ring - "O"	1	2JK-194A	3442	Washer	1



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

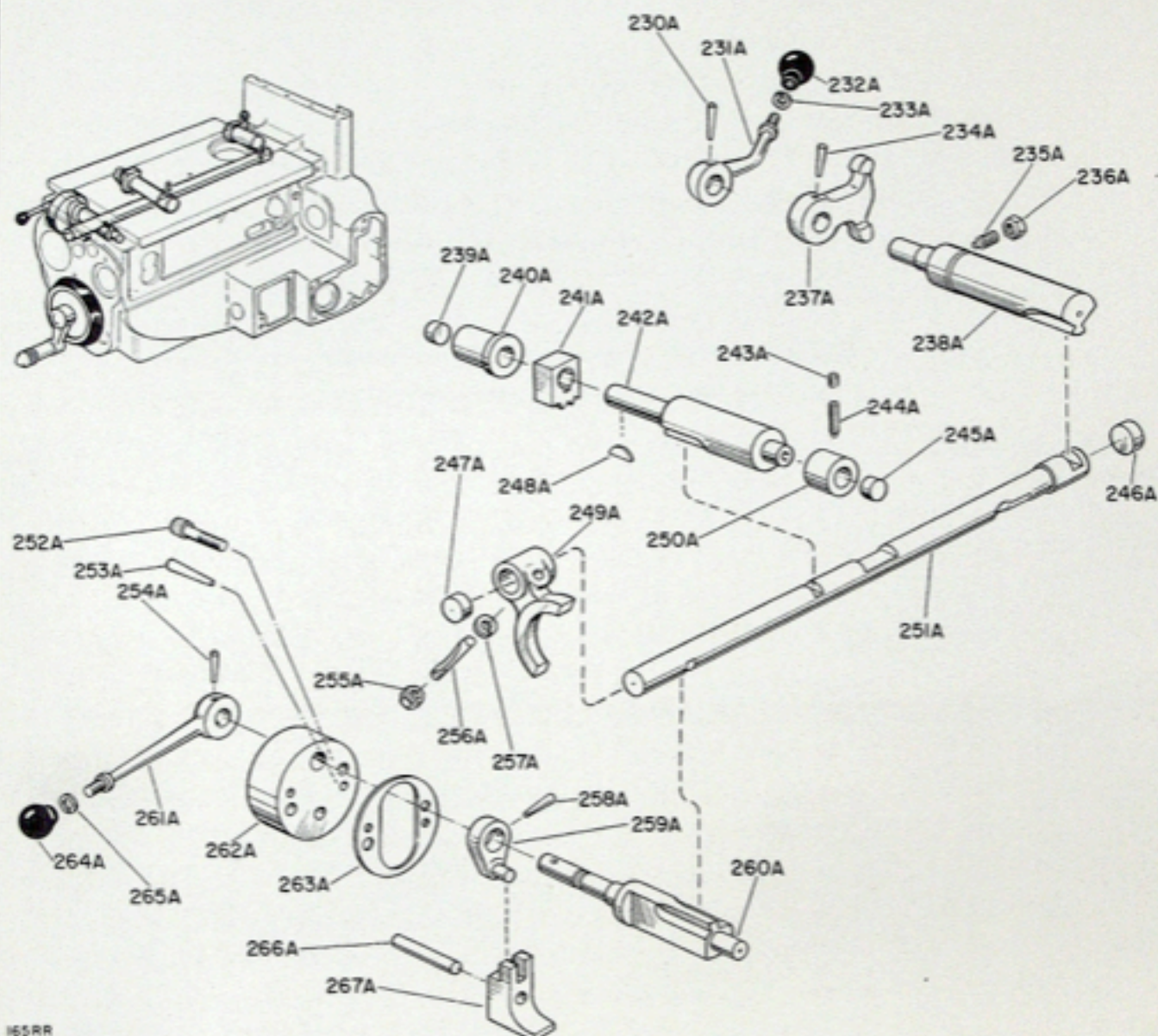
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

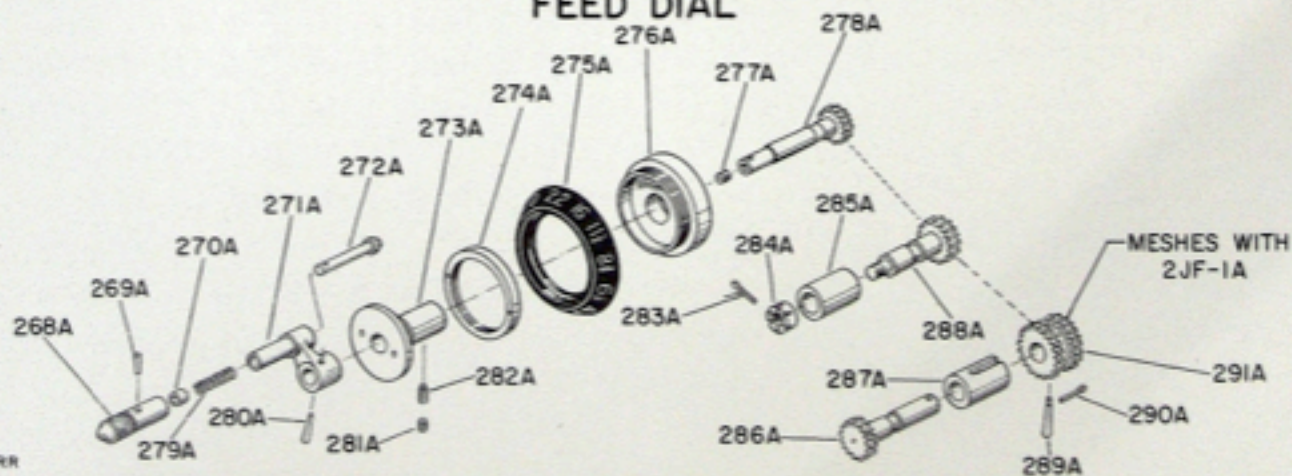
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-195A	642	Pin - Taper	1	2JK-212A	127468	Ring - "O"	1
2JK-196A	112819	Lever - Rear Rapid Traverse	1	2JK-213A		Cover - Rapid Traverse Control	
2JK-197A	2135	Washer - Lock	1		151601	2MI, 2ML Machines	1
2JK-198A	115032	Ball - Handle	1		156595	3MI Machines	1
2JK-199A	139947	Washer - Control Shaft	1	2JK-214A	642	Pin - Taper	1
2JK-200A	225409	Seal - Oil	1	2JK-215A	96507	Pin - Locking	1
2JK-201A		Bushing - Rear Rapid Traverse Shaft		2JK-216A	2135	Washer - Lock	1
	112825	2MI, 2ML Machines	1	2JK-217A	2144	Nut - Hex	1
	128512	3MI Machines	1	2JK-218A	114202	Spring - Rapid Traverse Lever	1
2JK-202A	112826	Lever - Rear Rapid Traverse Linkage	1	2JK-219A	3385	Pin - Straight	1
2JK-203A		Shaft - Control - Rear Rapid Traverse		2JK-220A	3382	Pin - Straight	1
	139948	2MI, 2ML Machines	1	2JK-221A	1655	Key	1
	139949	3MI Machines	1	2JK-222A	3431	Pin - Straight	1
2JK-204A	2144	Nut - Hex	1	2JK-223A	3472	Nut - Hex	1
2JK-205A	2135	Washer - Lock	1	2JK-224A	3229	Screw	1
2JK-206A	96507	Pin - Locking	1	2JK-225A	115032	Ball - Handle	1
2JK-207A	3549	Plug	1	2JK-226A	2135	Washer - Lock	1
2JK-208A		Bushing - Rapid Traverse Shaft	1	2JK-227A		Lever - Front Rapid Traverse	
	112823	2MI, 2ML Machines	1		116093	2MI, 2ML Machines	1
	128511	3MI Machines	1		112864	3MI Machines	1
2JK-209A	116373	Lever - Rapid Traverse Spring	1	2JK-228A	23204	Screw	4
2JK-210A		Shaft - Rapid Traverse Control		2JK-229A	1421	Pin	2
	161605	2MI, 2ML Machines	1				
	156596	3MI Machines	1				
2JK-211A		Fork - Rapid Traverse Shifter					
	151604	2MI, 2ML Machines	1				
	156594	3MI Machines	1				

VERTICAL FEED CONTROL



165RR

FEED DIAL



468RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

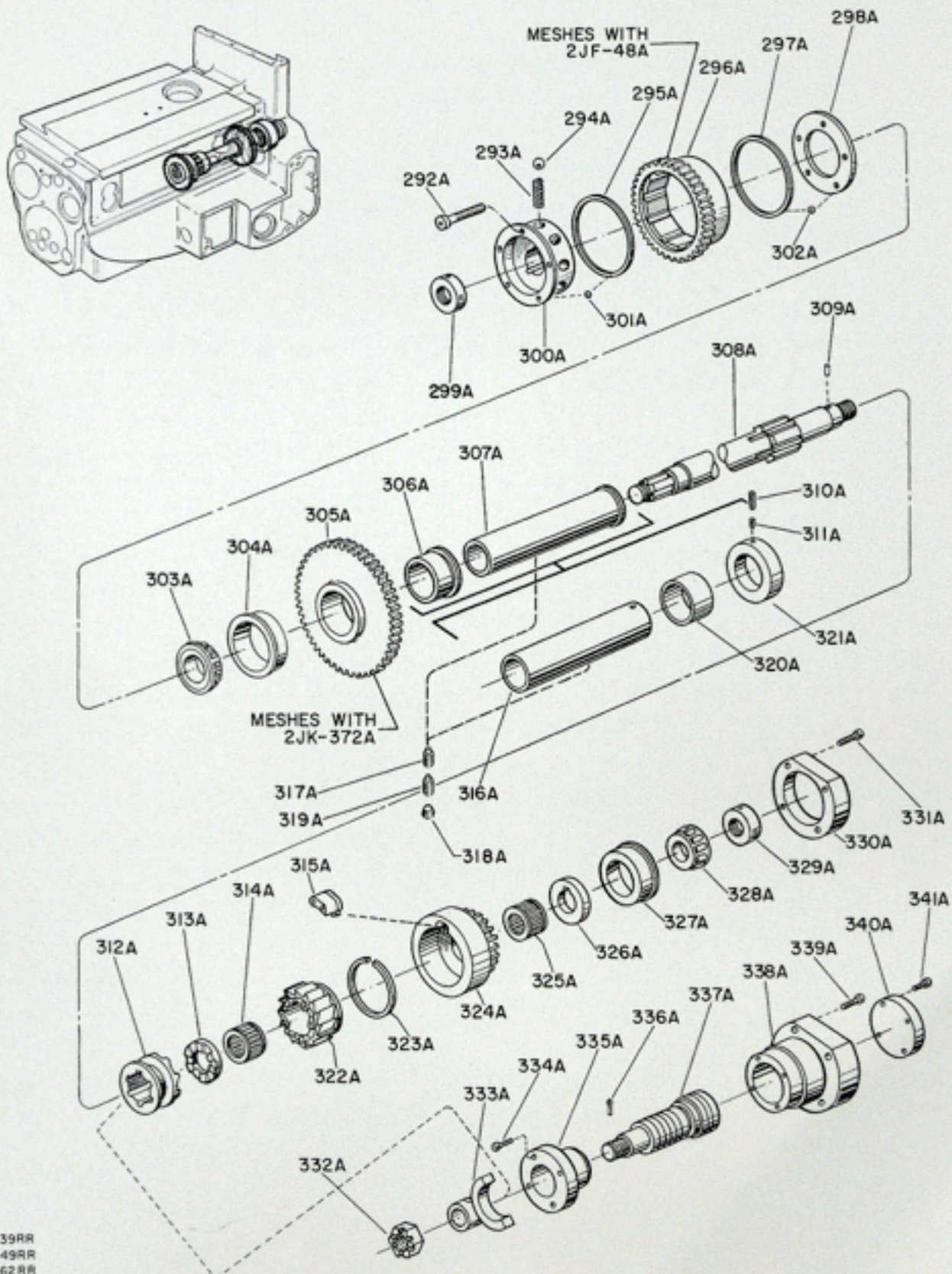
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-230A	663	Pin - Taper	1	2JK-258A	143	Pin - Taper	1
2JK-231A	123357	Lever - Rear Elevating (With Rear Controls)	1	2JK-259A	136540	Trip - Elevating Control Shaft	1
2JK-232A	115032	Ball - Handle (With Rear Controls)	1	2JK-260A		Shaft - Vertical Control	
2JK-233A	2135	Washer - Lock (With Rear Controls)	1		116146	2MI, 2ML Machines	1
2JK-234A	519	Pin - Taper	1		115338	3MI Machines	1
2JK-235A		Screw - Set	1	2JK-261A	112867	Lever - Elevating	1
	3232	2MI, 2ML Machines	1	2JK-262A	115340	Plug - Vertical Control Shaft	1
	3233	3MI Machines	1	2JK-263A	115344	Gasket	1
2JK-236A	3473	Nut - Hex (3MI Machines Only)	1	2JK-264A	2135	Washer - Lock	1
2JK-237A	71784	Lever - Elevating Trip	1	2JK-265A	115032	Ball - Handle	1
2JK-238A		Shaft - Rear Elevating		2JK-266A	115342	Pin - Vertical Control Shaft	1
	111770	2MI, 2ML Machines Without Rear Controls	1	2JK-267A	115346	Shifter - Elevating Knockout	1
	115396	3MI Machines Without Rear Controls	1	2JK-268A	112840	Handle - Feed Change	1
	111767	2MI, 2ML Machines With Rear Controls	1	2JK-269A	2291	Pin - Taper	1
	115395	3MI Machines With Rear Controls	1	2JK-270A	106992	Bushing - Feed Change	1
2JK-239A	3550	Plug	1	2JK-271A	111130	Lever - Feed Change	1
2JK-240A	116407	Bushing - Shifter Shaft	1	2JK-272A	111131	Pin - Feed Change Index	1
2JK-241A	111764	Detent - Control Rod	1	2JK-273A	112841	Plate - Feed Change Index	1
2JK-242A		Shaft - Elevating Shifter		2JK-274A	111165	Nut - Feed Change	1
	111776	2MI, 2ML Machines	1	2JK-275A		Dial - Feed	
	128523	3MI Machines	1		116477	1/2 x 60	1
2JK-243A	3211	Screw - Set	1		111190	1/4 x 30	1
2JK-244A	3237	Screw - Set	1	2JK-276A	111160	Gear - Internal - Feed Change	1
2JK-245A	3249	Plug	1	2JK-277A	217781	Screw - Set	1
2JK-246A	30715	Plug	1	2JK-278A	111128	Shaft - Feed Change	1
2JK-247A	30715	Plug	1	2JK-279A	253	Spring	1
2JK-248A	3280	Key	1	2JK-280A	143	Pin - Taper	1
2JK-249A		Fork - Gear Shifter		2JK-281A	3211	Screw - Set	1
	124679	2MI, 2ML Machines	1	2JK-282A	3233	Screw - Set	1
	128640	3MI Machines	1	2JK-283A	2095	Pin - Cotter	1
2JK-250A	116408	Bushing - Shifter Shaft	1	2JK-284A	111468	Nut - Slotted	1
2JK-251A		Rod - Shifter		2JK-285A	111158	Bushing	1
	116395	2MI, 2ML Plain and Universal Machines	1	2JK-286A		Shaft - Driving	
	118347	2MI Vertical Machines	1		124673	Plain and Universal Machines	1
	113492	3MI Machines	1		120614	Vertical Machines	1
2JK-252A	3251	Screw	2	2JK-287A		Bushing - Driving Shaft	
2JK-253A	645	Pin - Taper	2		111158	Plain and Universal Machines	1
2JK-254A	663	Pin - Taper	1		120615	Vertical Machines	1
2JK-255A	2144	Nut - Hex	1	2JK-288A	111469	Gear - Intermediate Feed	1
2JK-256A		Pin - Locking		2JK-289A	124672	Pin - Taper	1
	96507	2MI, 2ML Machines	1	2JK-290A	3329	Pin - Cotter	1
	33942	3MI Machines	1	2JK-291A		Gear - Primary Cam Shaft	
2JK-257A	2135	Washer - Lock	1		124674	2MI, 2ML Plain and Universal Machines	1
					120616	2MI Vertical Machines	1
					128498	3MI Machines	1

SAFETY GEAR SHAFT



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

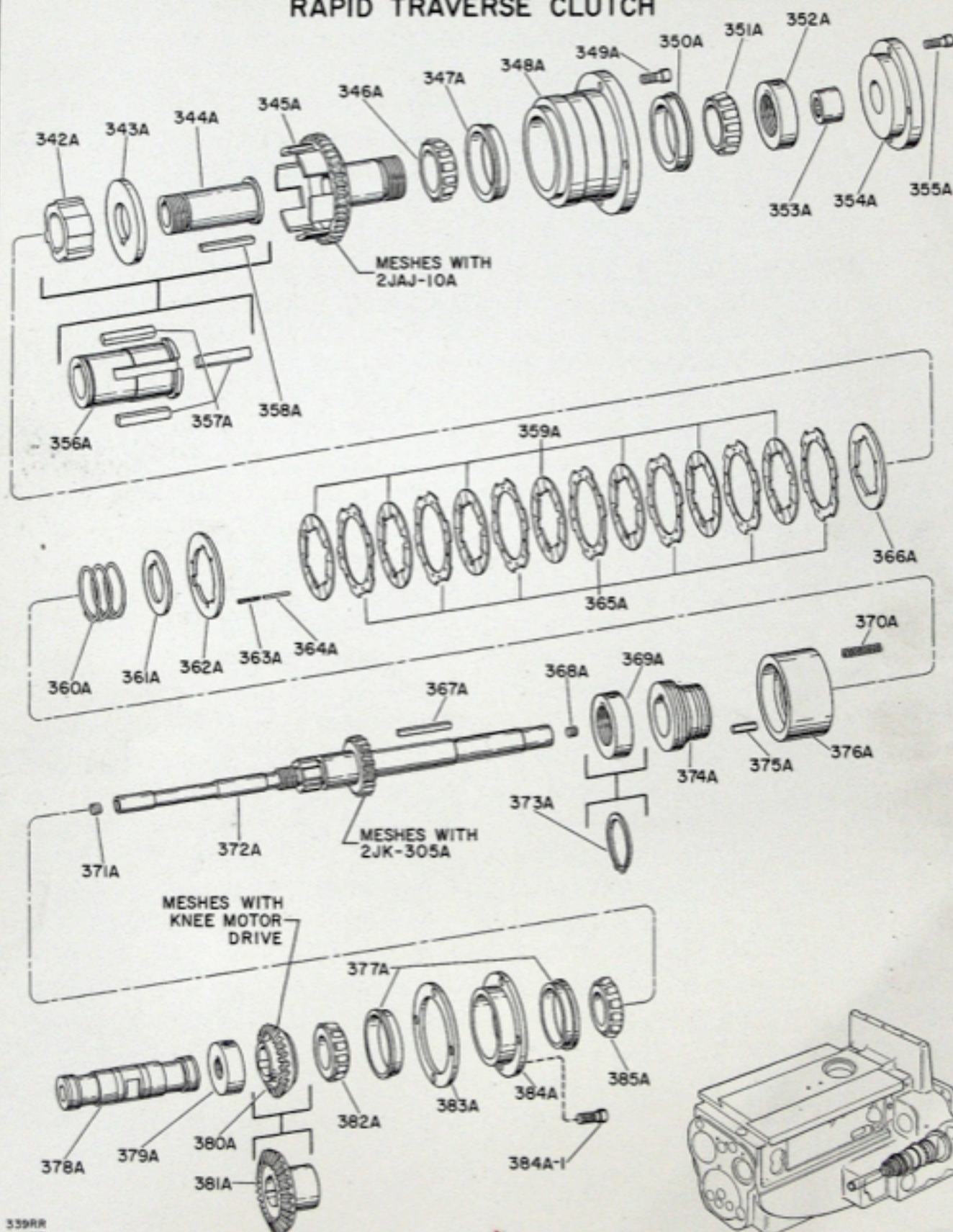
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-292A	3397	Screw	5	2JK-317A	3229	Screw - Set	1
2JK-293A	165975	Spring - Start and Stop	10	2JK-318A	76644	Plug - Pipe	1
2JK-294A	36147	Ball - Steel	10	2JK-319A	3229	Screw - Set	1
2JK-295A	111163	Ring - Safety Gear Spacer	1	2JK-320A	128629	Bushing - Idler Gear (3MI Machines Only)	1
2JK-296A	158879	Gear - Safety	1	2JK-321A	114107	Collar (3MI Machines Only)	1
2JK-297A	111163	Ring - Safety Gear Spacer	1	2JK-322A	134315	Ratchet - Clutch	1
2JK-298A	111146	Retainer - Safety Gear	1	2JK-323A	111144	Ring - Ratchet Dogs	1
2JK-299A		Nut - Lock	1	2JK-324A		Gear Clutch	1
	4242	2MI, 2ML Machines	1		111187	2MI, 2ML Machines	1
	166678	3MI Machines	1		114109	3MI Machines	1
2JK-300A	158878	Body - Safety Gear	1	2JK-325A	111136	Bearing - Needle	1
2JK-301A	2290	Ball - Steel	64	2JK-326A	151591	Spacer - Ratchet Gear	1
2JK-302A	2290	Ball - Steel	64	2JK-327A	98776	Cup - Bearing	1
2JK-303A	111030	Cone - Bearing	1	2JK-328A	62903	Cone - Bearing	1
2JK-304A	98776	Cup - Bearing	1	2JK-329A	4242	Nut - Lock	1
2JK-305A		Gear - Feed Box Idler	1	2JK-330A		Plug - Safety Gear Shaft	1
	151597	2MI, 2ML Machines	1		151609	2MI, 2ML Machines	1
	114111	3MI Machines	1		156593	3MI Machines	1
2JK-306A	151587	Bushing - Idler Gear (2MI, 2ML Machines Only)	1	2JK-331A	2320	Screw	4
2JK-307A	161911	Bushing - Feed Drive Idler (2MI, 2ML Machines Only)	1	2JK-332A	2087	Nut - Slotted	1
2JK-308A		Shaft - Safety Gear	1	2JK-333A		Fork - Feed Clutch	1
	151616	2MI, 2ML Machines	1		156859	2MI, 2ML Machines	1
	156581	3MI Machines	1		156580	3MI Machines	1
2JK-309A	3636	Pin	1	2JK-334A	3396	Screw	4
2JK-310A	78600	Screw - Set (3MI Machines Only)	1	2JK-335A	151580	Sleeve - Feed Clutch	1
2JK-311A	3230	Screw - Set (3MI Machines Only)	1	2JK-336A	1987	Pin - Cotter	1
2JK-312A	134314	Clutch - Feed Drive	1	2JK-337A	151595	Piston - Feed Clutch	1
2JK-313A	111134	Washer - Thrust	1	2JK-338A	151618	Cylinder - Feed Clutch	1
2JK-314A	111136	Bearing - Needle	1	2JK-339A	3266	Screw	4
2JK-315A	110769	Pin - Safety Gear	1	2JK-340A	166163	Head - Feed Clutch Cylinder	1
2JK-316A	157923	Bushing - Feed Drive Idler (3MI Machines Only)	1	2JK-341A	3396	Screw	4

RAPID TRAVERSE CLUTCH



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

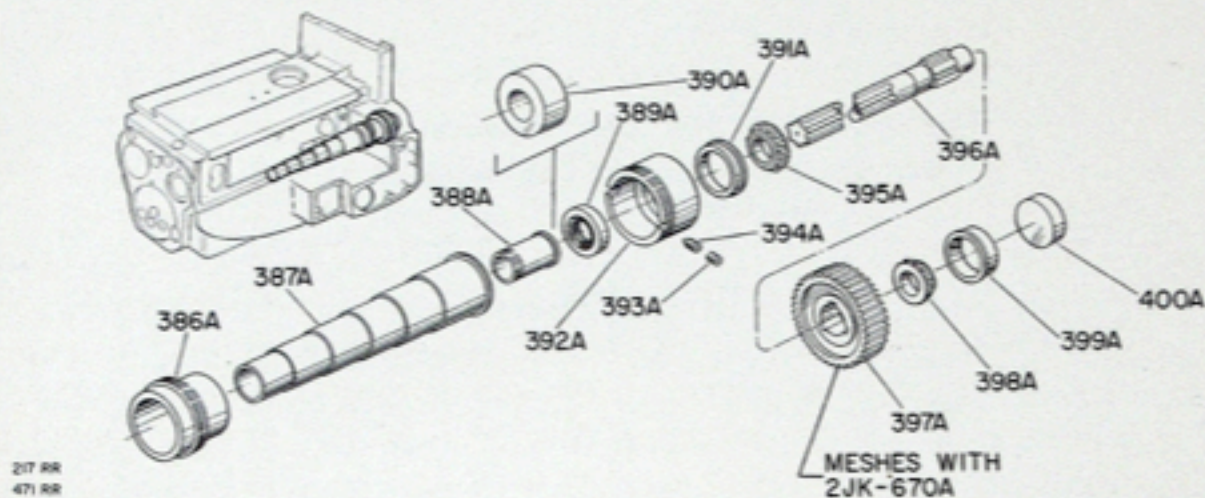
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

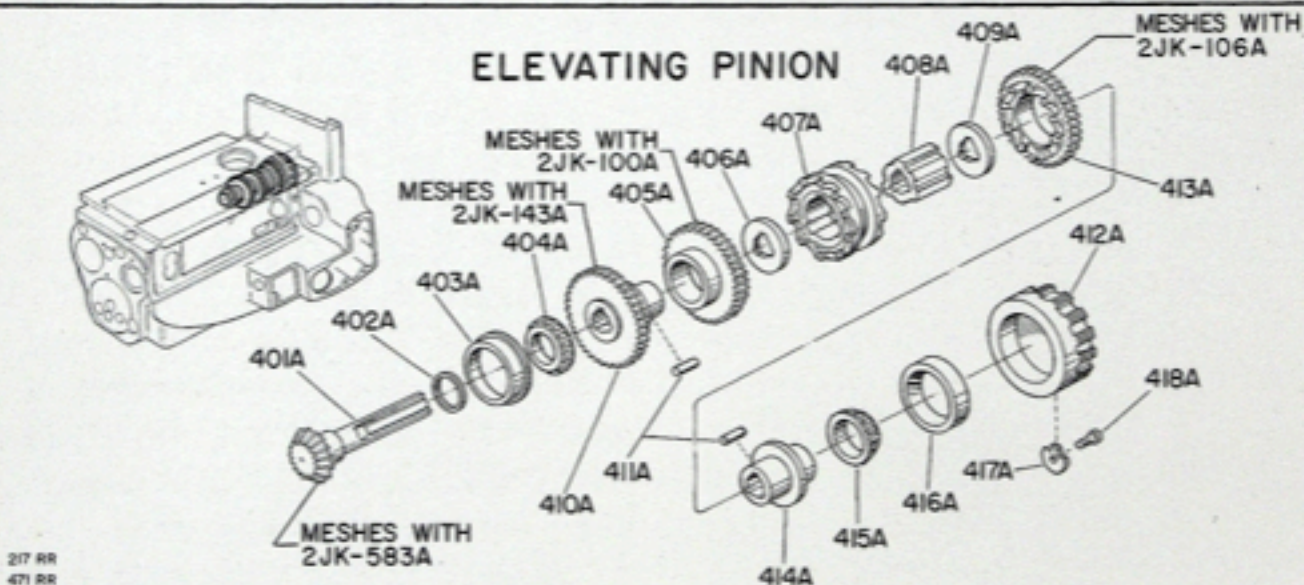
2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-342A	151680	Sleeve - Splined Clutch (2MI, 2ML Machines Only)	1	2JK-366A	151585	Plate - Lock	
2JK-343A	166032	Plate - Clamping (2MI, 2ML Machines Only)	1		136865	2MI, 2ML Machines	1
2JK-344A	151599	Sleeve - Rapid Traverse Clutch (2MI, 2ML Machines Only)	1	2JK-367A	1883	3MI Machines	1
2JK-345A		Gear - Rapid Traverse Clutch			1448	Key	
	165994	2MI, 2ML Machines	1		4236	2MI, 2ML Machines	1
	136324	3MI Machines	1	2JK-368A	76645	3MI Machines	1
2JK-346A	69189	Cone - Bearing	1		4192	Plug - Pipe	
2JK-347A	108271	Cup - Bearing	1	2JK-369A	82304	2MI, 2ML Machines	1
2JK-348A		Bushing - Bearing Retainer		2JK-370A		3MI Machines	1
	159064	2MI, 2ML Machines	1	2JK-371A	4236	Nut - Lock (2MI, 2ML Machines Only)	1
	156585	3MI Machines	1		76644	Spring (3MI Machines Only)	4
2JK-349A		Screw				Plug - Pipe	
	2320	2MI, 2ML Machines	6		151617	2MI, 2ML Machines	1
	3266	3MI Machines	6	2JK-372A	156577	3MI Machines	1
2JK-350A	108271	Cup - Bearing	1		233951	Shaft - Rapid Traverse Clutch	
2JK-351A	69189	Cone - Bearing	1	2JK-373A		2MI, 2ML Machines	1
2JK-352A		Nut - Lock		2JK-374A		3MI Machines	1
	4247	2MI, 2ML Machines	1		151576	Ring - Truarc (3MI Machines Only)	1
	4190	3MI Machines	1		165036	Piston - Rapid Traverse Clutch	
2JK-353A		Bearing - Needle		2JK-375A	234431	2MI, 2ML Machines	1
	237109	2MI, 2ML Machines	1			3MI Machines	1
	237170	3MI Machines	1	2JK-376A	151577	Pin (3MI Machines Only)	1
2JK-354A		Cup - Rapid Traverse Clutch Shaft			165037	Cylinder - Rapid Traverse Clutch	
	151582	2MI, 2ML Machines	1	2JK-377A		2MI, 2ML Machines	1
	156582	3MI Machines	1		95588	3MI Machines	1
2JK-355A		Screw			108271	Cup - Bearing	
	3396	2MI, 2ML Machines	4	2JK-378A		2MI, 2ML Machines	2
	2320	3MI Machines	4		151603	3MI Machines	2
2JK-356A	165035	Sleeve - Clutch (3MI Machines Only)	1		156583	Body - Rapid Traverse Clutch Valve	
2JK-357A	126620	Key (3MI Machines Only)	3	2JK-379A		2MI, 2ML Machines	1
2JK-358A	103786	Key (2MI, 2ML Machines Only)	1		4241	3MI Machines	1
2JK-359A		Plate - Clutch - Driven			4242	Nut - Lock	
	117207	2MI, 2ML Machines	7	2JK-380A	151612	2MI, 2ML Machines	1
	136862	3MI Machines	8	2JK-381A	156588	3MI Machines	1
2JK-360A	151594	Spring (2MI, 2ML Machines Only)	1			Gear - Bevel (2MI, 2ML Machines Only)	1
2JK-361A		Plate - Clamping		2JK-382A		Gear - Bevel (3MI Machines Only)	1
	151593	2MI, 2ML Machines	1		95585	Cone - Bearing	
	165034	3MI Machines	1		69189	2MI, 2ML Machines	1
2JK-362A		Plate - Lock		2JK-383A		3MI Machines	1
	165995	2MI, 2ML Machines	1		151589	Spacer - Bearing Bushing	
	136865	3MI Machines	1	2JK-384A	156599	2MI, 2ML Machines	1
2JK-363A		Spring - Compression				3MI Machines	1
	266	2MI, 2ML Machines	3		151590	Bushing - Bearing	
	136873	3MI Machines	3		156598	2MI, 2ML Machines	1
2JK-364A		Pin - Guide		2JK-384A-1	2320	3MI Machines	1
	164958	2MI, 2ML Machines	3	2JK-385A		Screw	4
	136835	3MI Machines	3		95585	Cone - Bearing	
2JK-365A		Plate - Clutch - Driving			69189	2MI, 2ML Machines	1
	121451	2MI, 2ML Machines	7			3MI Machines	1
	136863	3MI Machines	9				

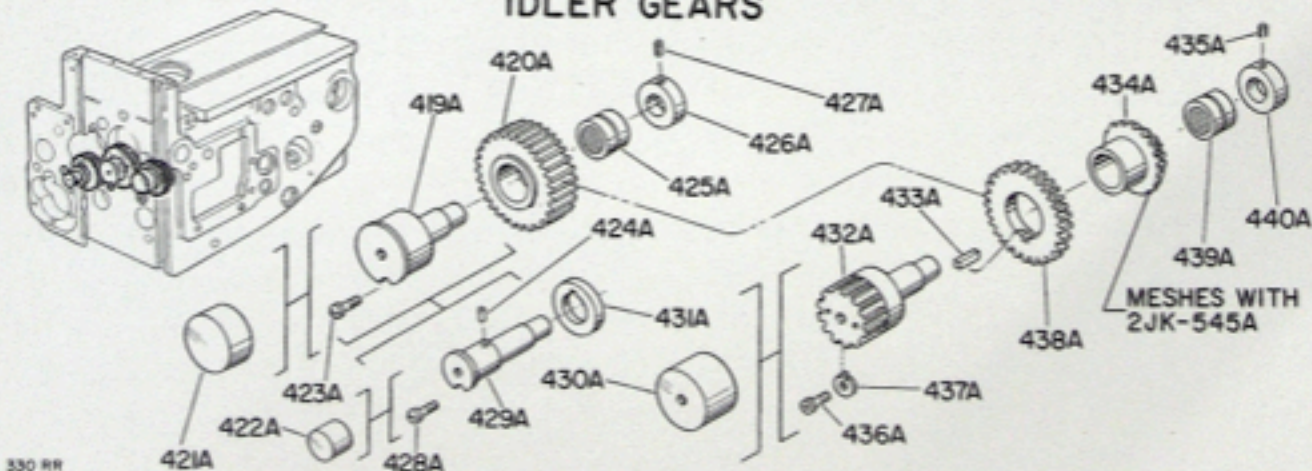
SPLINE SHAFT



ELEVATING PINION



IDLER GEARS



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

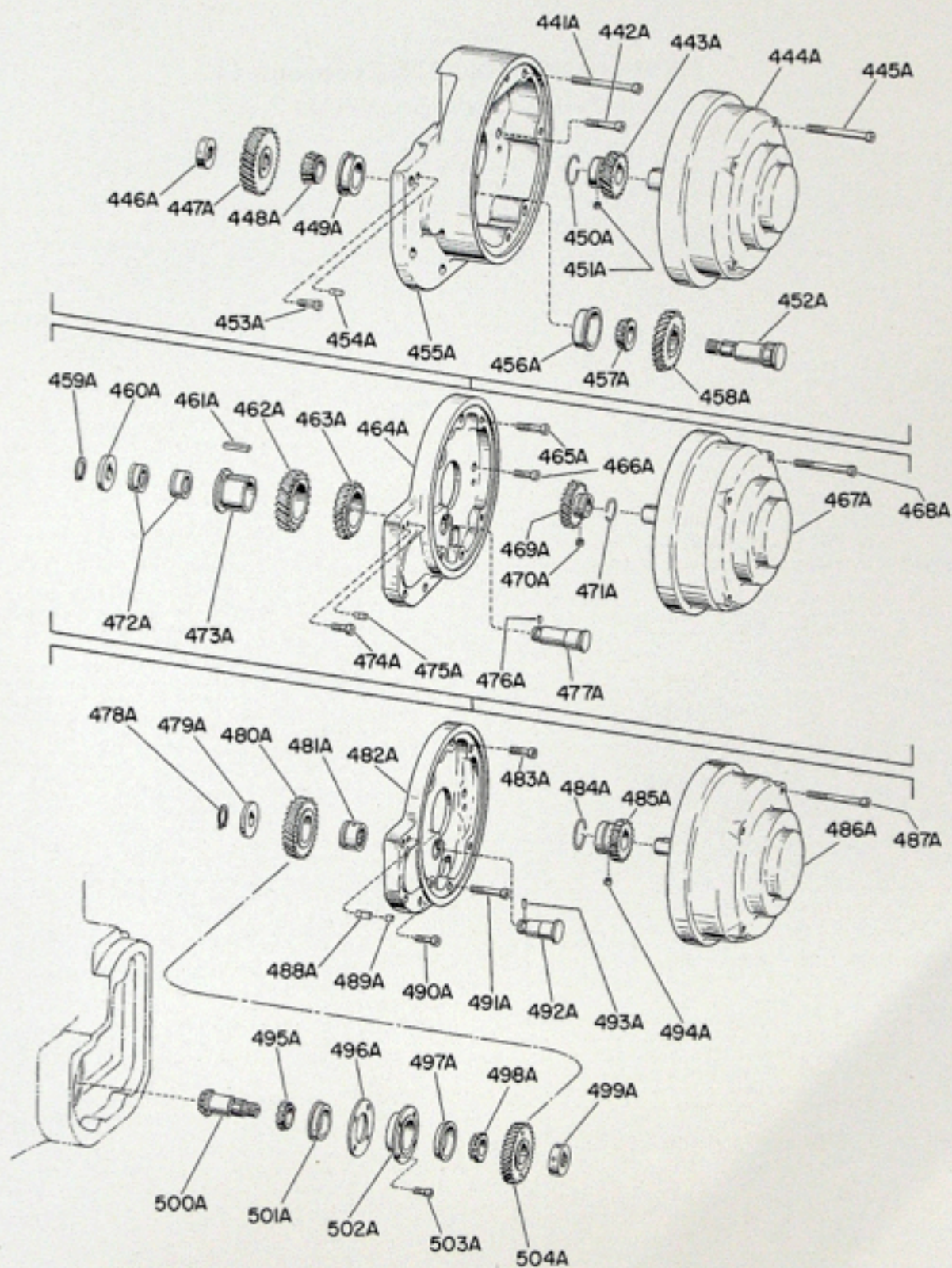
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-386A		Housing - Spline Shaft Guard		2JK-411A	124667	Roller - Bearing	36
	118333	2MI, 2ML Machines	1	2JK-412A		Nut - Bearing Adjusting	
	128501	3MI Machines	1		111127	2MI, 2ML Machines	1
2JK-387A		Guard - Spline Shaft			114099	3MI Machines	1
	118324	2MI, 2ML Machines	1	2JK-413A		Gear - Elevating Clutch	
	128516	3MI Machines	1		111169	2MI, 2ML Machines	1
2JK-388A		Guard - Shaft			114102	3MI Machines	1
	118325	2MI, 2ML Machines	1	2JK-414A	111120	Bushing - Pinion Shaft	1
	128507	3MI Machines	1	2JK-415A	69189	Cone - Bearing	1
2JK-389A	93236	Seal - Oil	1	2JK-416A	58870	Cup - Bearing	1
2JK-390A	128502	Filler - Sliding Tubes (3MI Machines Only)	1	2JK-417A	3445	Washer - Lock	1
				2JK-418A	3210	Screw	1
2JK-391A	95586	Cup - Bearing	1	2JK-419A	111423	Stud - Idler Spur Gear (2MI, 2ML Machines With Rear Controls)	1
2JK-392A	118334	Nut - Spline Shaft	1	2JK-420A		Gear - Idler Spur	
2JK-393A		Screw - Set			111418	2MI, 2ML Machines With Rear Controls	1
	1911	2MI, 2ML Machines	1		114155	3MI Machines With Rear Controls	1
	2286	3MI Machines	1	2JK-421A	3556	Plug (2MI, 2ML Machines Without Rear Controls)	1
2JK-394A		Screw - Set		2JK-422A	3553	Plug (3MI Machines Without Rear Controls)	1
	3233	2MI, 2ML Machines	1		104202	Screw - Gear Stud (2MI, 2ML Machines With Rear Controls)	1
	3232	3MI Machines	1	2JK-423A	104202	Pin - Straight - (3MI Machines With Rear Controls)	1
2JK-395A	95585	Cone - Bearing	1	2JK-424A	3539	Bearing - Needle (With Rear Controls)	1
2JK-396A		Shaft - Spline		2JK-425A	108529	Collar - Stud (With Rear Controls)	1
	118311	2MI, 2ML Machines	1	2JK-426A	111425	Screw - Set (With Rear Controls)	1
	112829	3MI Machines	1	2JK-427A	1917	Screw - Gear Stud (3MI Machines With Rear Controls)	1
2JK-397A		Gear - Table Traverse Drive		2JK-428A	104202	Stud - Idler Spur Gear (3MI Machines With Rear Controls)	1
	118332	2MI, 2ML Machines	1	2JK-429A	114156	Plug (Without Rear Controls)	1
	114094	3MI Machines	1	2JK-430A	111786	Washer - Idler Stud (3MI Machines With Rear Controls)	1
2JK-398A	95585	Cone - Bearing	1	2JK-431A	114198	Stud - Idler Bevel Gear (With Rear Controls)	1
2JK-399A	95586	Cup - Bearing	1	2JK-432A	142827	Key - Square (With Rear Controls)	1
2JK-400A	213344	Plug	1	2JK-433A	3371	Gear - Idler (With Rear Controls)	1
2JK-401A		Shaft - Elevating Pinion		2JK-434A	142823	Screw - Set (With Rear Controls)	1
	121508	2MI, 2ML Machines	1	2JK-435A	1917	Screw (With Rear Controls)	1
	128690	3MI Machines	1	2JK-436A	3210	Washer - Lock (With Rear Controls)	1
2JK-402A		Washer - Fitting		2JK-437A	3445	Gear - Spur	
	121509	2MI, 2ML Machines	1	2JK-438A		2MI, 2ML Machines With Rear Controls	1
	128689	3MI Machines	1		142822	3MI Machines With Rear Controls	1
2JK-403A		Cup - Bearing		2JK-439A	142819	Bearing - Needle (With Rear Controls)	1
	93686	2MI, 2ML Machines	1	2JK-440A	142820	Collar - Stud (With Rear Controls)	1
	74228	3MI Machines	1				
2JK-404A		Cone - Bearing					
	212543	2MI, 2ML Machines	1				
	114098	3MI Machines	1				
2JK-405A		Gear - Elevating Clutch					
	111169	2MI, 2ML Machines	1				
	114102	3MI Machines	1				
2JK-406A	108280	Washer - Pinion Shaft	1				
2JK-407A	108420	Clutch - Elevating	1				
2JK-408A	108281	Bushing - Clutch	1				
2JK-409A	108280	Washer - Pinion Shaft	1				
2JK-410A		Gear - Pinion Shaft					
	111168	2MI, 2ML Machines	1				
	142828	3MI Machines	1				

MOTOR DRIVE



420RR
443RR
340RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

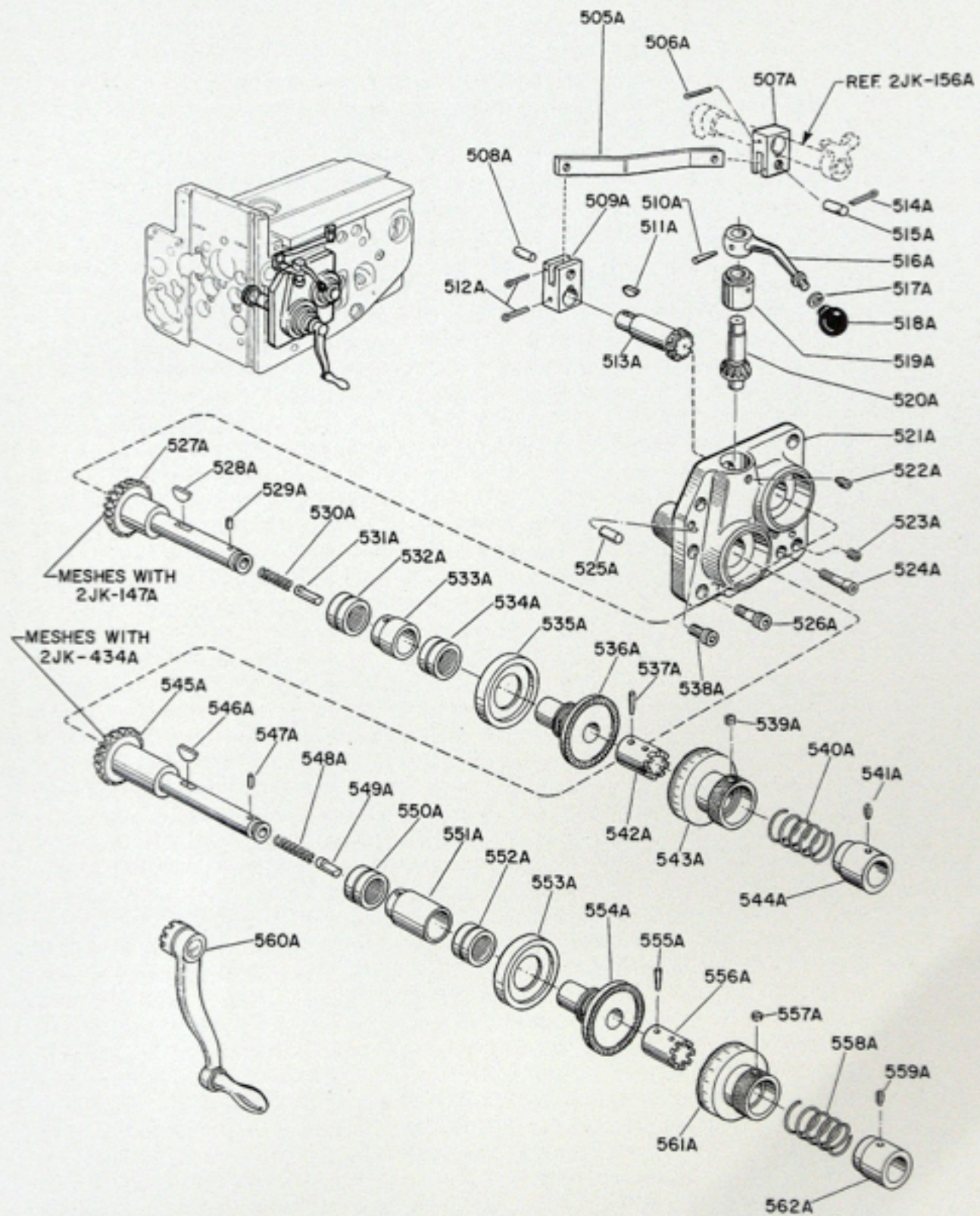
KNEE—UNIT No. 2JK (Continued)

MACHINES AS INDICATED BELOW

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
3MI - 1500 RPM				2JK-480A		Gear - Idler	
2JK-441A	3216	Screw	3	151584		2MI, 2ML Machines	1
2JK-442A	2300	Screw	1	156586		3MI Machines	1
2JK-443A	162791	Pinion - Motor Shaft Helical	1	2JK-481A		Bearing - Needle	
2JK-444A	Example*	Motor - Drive	1	237170		2MI, 2ML Machines	1
2JK-445A	Example*	Screw - Motor	4	108526		3MI Machines	1
2JK-446A	4241	Nut - Lock	1	2JK-482A		Plate - Adapter	
2JK-447A	162788	Gear - Helical Driver	1	151619		2MI, 2ML Plain and Universal Machines	1
2JK-448A	72197	Cone - Bearing	1	155076		2MI Vertical Machines	1
2JK-449A	108004	Cup - Bearing	1	157337		3MI Machines	1
2JK-450A	96167	Ring - Retainer	1	2JK-483A	3400	Screw	3
2JK-451A	3232	Screw - Set	1	2JK-484A		Ring - Retainer	
2JK-452A	162790	Stud - Motor Drive Idler	1	96166		2MI, 2ML Machines	1
2JK-453A	3400	Screw	3	96167		3MI Machines	1
2JK-454A	1664	Pin	2	2JK-485A		Pinion - Motor Shaft Helical	
2JK-455A	162932	Plate - Adapter	1	151613		2MI, 2ML Machines	1
2JK-456A	108004	Cup - Bearing	1	156590		3MI Machines	1
2JK-457A	72197	Cone - Bearing	1	Example*		Motor - Drive	1
2JK-458A	162789	Gear - Helical	1	2JK-487A	Example*	Screw - Motor	4
2MI, 2ML PLAIN AND UNIVERSAL				2JK-488A		Pin	
2MI VERTICAL WITHOUT POWER FEED TO VERTICAL HEAD				1664		Plain and Universal Machines	2
1500 RPM				1966		Vertical Machines	2
2JK-459A	237432	Ring - Truarc	1	2JK-489A	3385	Pin (Vertical Machines Only)	2
2JK-460A	151658	Washer - Idler Stud	1	2JK-490A		Screw	
2JK-461A	1987	Key	1	3266		Plain and Universal Machines	4
2JK-462A	160472	Gear - Helical Driver	1	3402		Vertical Machines	6
2JK-463A	160473	Gear - Helical - Driven	1	2JK-491A	3262	Screw (Vertical Machines Only)	1
2JK-464A	160475	Plate - Adapter	1	2JK-492A		Stud - Motor Drive Idler	
2JK-465A	2300	Screw	3	151583		2MI, 2ML Machines	1
2JK-466A	3251	Screw	1	157333		3MI Machines	1
2JK-467A	Example*	Motor - Drive	1	2JK-493A	3266	Pin	1
2JK-468A	Example*	Screw - Motor	4	2JK-494A	3232	Screw	1
2JK-469A	160474	Pinion - Motor Shaft Helical	1	2JK-495A	212905	Cone - Bearing	1
2JK-470A	3232	Screw	1	2JK-496A		Spacer - Pinion Bushing	
2JK-471A	96166	Ring - Retainer	1	151588		2MI, 2ML Machines	1
2JK-472A	245861	Bearing - Needle	2	157326		3MI Machines	1
2JK-473A	160471	Sleeve - Motor Drive Stud	1	108367		Cup - Bearing	1
2JK-474A	3266	Screw	3	2JK-498A	212905	Cone - Bearing	1
2JK-475A	1664	Pin	2	2JK-499A	4241	Nut - Lock	1
2JK-476A	3636	Pin	1	2JK-500A		Pinion - Bevel	
2JK-477A	160470	Stud - Motor Drive Idler	1	151606		2MI, 2ML Machines	1
2MI, 2ML, 3MI PLAIN AND UNIVERSAL				156587		3MI Machines	1
2MI VERTICAL WITHOUT POWER FEED TO VERTICAL HEAD				108367		Cup - Bearing	1
1800 RPM				2JK-501A		Bushing - Pinion Bearing Retainer	
2JK-478A		Ring - Truarc		151586		2MI, 2ML Machines	1
237432		2MI, 2ML Machines	1	157327		3MI Machines	1
113079		3MI Machines	1	2JK-503A		Screw	
2JK-479A		Washer - Idler Stud		2320		2MI, 2ML Machines	1
151658		2MI, 2ML Machines	1	2321		3MI Machines	1
157328		3MI Machines	1	2JK-504A		Gear - Helical	
				151615		2MI, 2ML Machines	1
				156589		3MI Machines (1800 RPM)	1
				162787		3MI Machines (1500 RPM)	1

*Give serial number of machine when ordering this part.

REAR CONTROL BRACKET



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

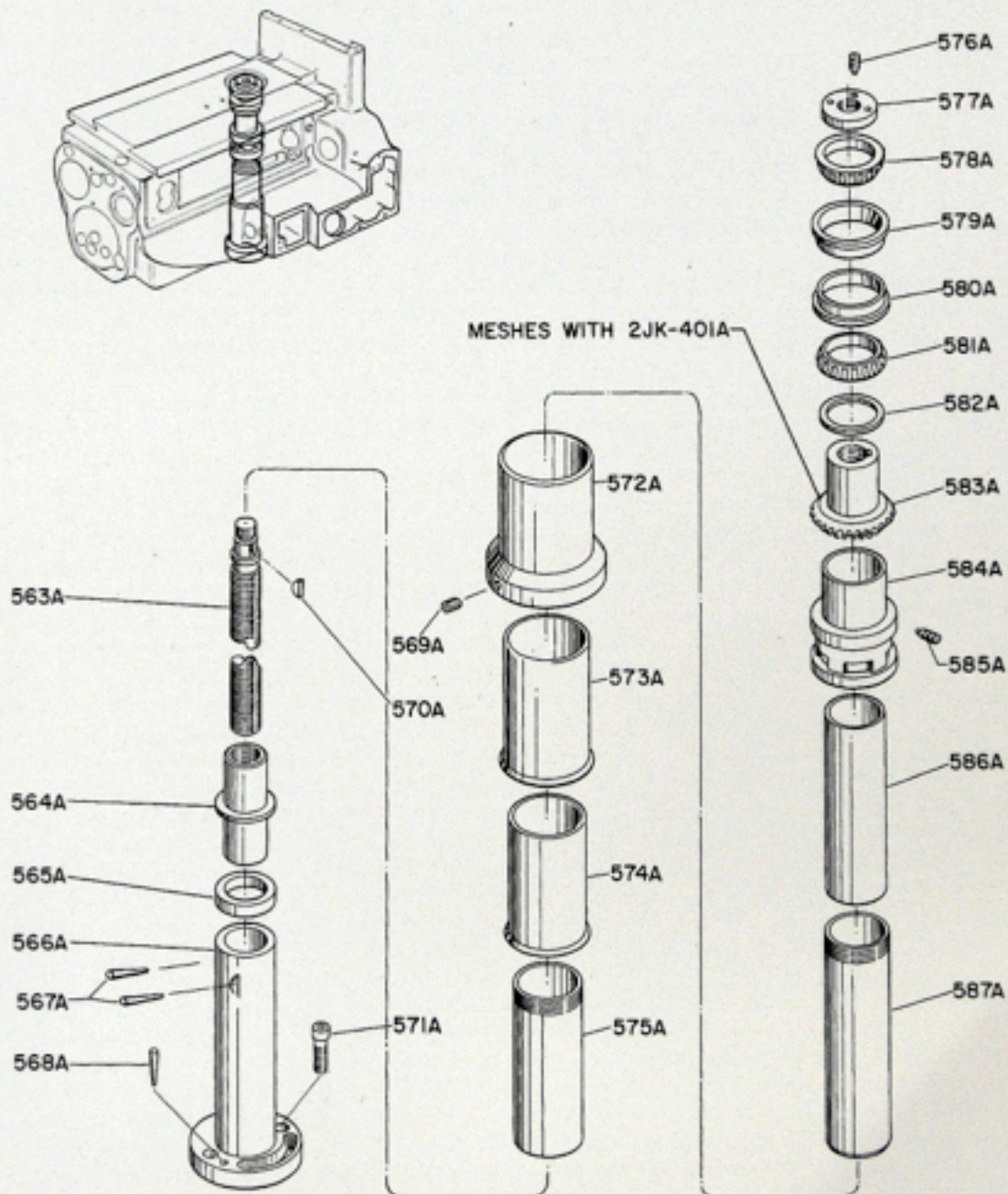
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL WITH REAR CONTROL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-505A		Link - Rear Cross		2JK-533A	113477	Spacer - Rear Elevating Control	1
	111752	2MI, 2ML Plain and Universal Machines	1	2JK-534A	231380	Bearing - Needle	1
	131496	2MI Vertical Machines	1	2JK-535A	113486	Retainer - Oil	1
	128497	3MI Machines	1	2JK-536A	113487	Clutch - Rear Elevating Dial	1
2JK-506A	1987	Pin - Cotter	1	2JK-537A	642	Pin - Taper	1
2JK-507A	111753	Link - Rear Cross - Short	1	2JK-538A	3215	Screw	1
2JK-508A	111751	Pin - Rear Cross	1	2JK-539A	102852	Plug - Pipe	1
2JK-509A	111753	Link - Rear Cross	1	2JK-540A	102083	Spring	1
2JK-510A	663	Pin - Taper	1	2JK-541A	3232	Screw	1
2JK-511A	3280	Key	1	2JK-542A	113485	Clutch - Rear Crank	1
2JK-512A	1987	Pin - Cotter	2	2JK-543A	115209	Dial - Elevating	1
2JK-513A	115474	Shaft - Rear Cross	1	2JK-544A	111464	Bushing - Retainer	1
2JK-514A	1987	Pin - Cotter	1	2JK-545A	142826	Gear - Shaft Bevel	1
2JK-515A	111751	Pin - Rear Cross	1	2JK-546A	3280	Key	1
2JK-516A	112865	Lever - Rear Cross Control	1	2JK-547A	63067	Pin	1
2JK-517A	2135	Washer - Lock	1	2JK-548A	102462	Spring - Compression	1
2JK-518A	115032	Ball - Handle	1	2JK-549A	63079	Pin - Crank Handle	1
2JK-519A	111499	Bushing - Rear Cross Lever	1	2JK-550A	231380	Bearing - Needle	1
2JK-520A	111497	Gear - Rear Cross Bevel	1	2JK-551A	113482	Spacer - Rear Cross Control	1
2JK-521A	149800	Bracket - Rear Control	1	2JK-552A	231380	Bearing - Needle	1
2JK-522A	3228	Screw - Set	1	2JK-553A	113486	Retainer - Oil	1
2JK-523A	76644	Plug - Pipe	6	2JK-554A	113489	Clutch - Rear Cross Dial	1
2JK-524A	3162	Screw	2	2JK-555A	642	Pin - Taper	1
2JK-525A	1429	Pin - Straight	1	2JK-556A	113485	Clutch - Rear Crank	1
2JK-526A	3403	Screw	3	2JK-557A	102852	Plug - Pipe	1
2JK-527A	113484	Gear - Shaft Bevel	1	2JK-558A	102083	Spring	1
2JK-528A	3280	Key	1	2JK-559A	3232	Screw	1
2JK-529A	63067	Pin	1	2JK-560A	161086	Crank - Rear Control	1
2JK-530A	102462	Spring - Compression	1	2JK-561A	115203	Dial - Cross	1
2JK-531A	63079	Pin - Crank Handle	1	2JK-562A	111464	Bushing - Retainer	1
2JK-532A	231380	Bearing - Needle	1				

ELEVATING SCREW



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

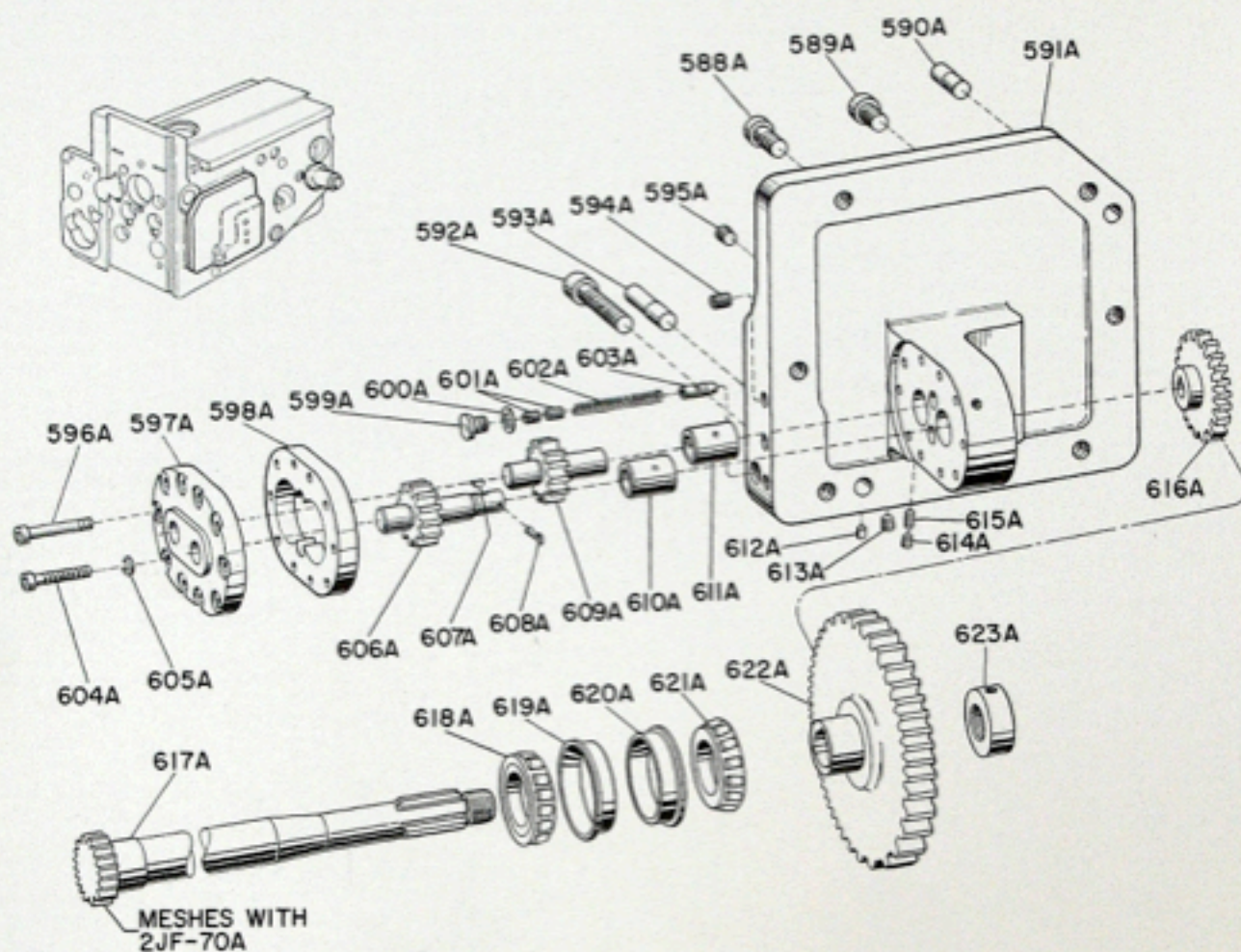
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued)

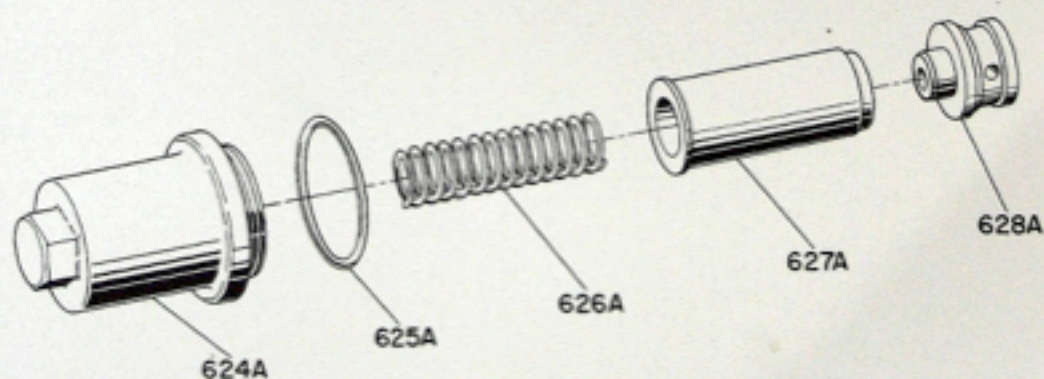
2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-563A		Screw - Elevating		2JK-578A		Cone - Bearing	
	161854	2MI Plain Machines	1		75972	2MI, 2ML Machines	1
	161851	2MI Universal and Vertical, 2ML Machines	1		114120	3MI Machines	1
	161860	3MI Plain Machines	1	2JK-579A		Cup - Bearing	
	161857	3MI Universal Machines	1		75973	2MI, 2ML Machines	1
2JC-564A	144930	Nut - Elevating	1		114119	3MI Machines	1
2JC-565A	111396	Spacer - Elevating Nut (Plain Machines Only)	1	2JK-580A		Cup - Bearing	
2JC-566A		Pedestal			75973	2MI, 2ML Machines	1
	161912	2MI, 2ML Machines	1		114119	3MI Machines	1
	161913	3MI Machines	1	2JK-581A		Cone - Bearing	
2JC-567A	143	Pin - Taper	2		75972	2MI, 2ML Machines	1
2JC-568A	642	Pin - Taper	1		114120	3MI Machines	1
2JC-569A	70198	Screw - Set	1	2JK-582A		Washer - Elevating Gear	
2JC-570A	679	Key	1		121576	2MI, 2ML Machines	1
2JC-571A	3403	Screw	2		128514	3MI Machines	1
2JC-572A		Tube - 4-1/4 in.		2JK-583A		Gear - Elevating	
	161868	2MI, 2ML Machines	1		121574	2MI, 2ML Machines	1
	161874	3MI Machines	1		128521	3MI Machines	1
2JC-573A		Tube - 4 in.		2JK-584A		Sleeve - Elevating Screw	
	161867	2MI, 2ML Machines	1		116362	2MI, 2ML Machines	1
	161873	3MI Machines	1		128520	3MI Machines	1
2JC-574A		Tube - 3-3/4 in.		2JC-585A	3233	Screw - Set	1
	161866	2MI, 2ML Machines	1	2JC-586A		Tube - Telescopic - 2-3/4 in.	
	161872	3MI Machines	1		161863	2MI, 2ML Machines	1
2JC-575A		Tube - 3-1/2 in.			161869	3MI Machines	1
	161865	2MI, 2ML Machines	1	2JC-587A		Tube - Telescopic - 3 in.	
	161871	3MI Machines	1		161864	2MI, 2ML Machines	1
2JC-576A	3232	Screw - Set	1		161870	3MI Machines	1
2JC-577A		Nut - Locking					
	111395	2MI, 2ML Machines	1				
	128253	3MI Machines	1				

HYDRAULIC PUMP



SKINNER FILTER



342 RR
442 RR
448 RR
465 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

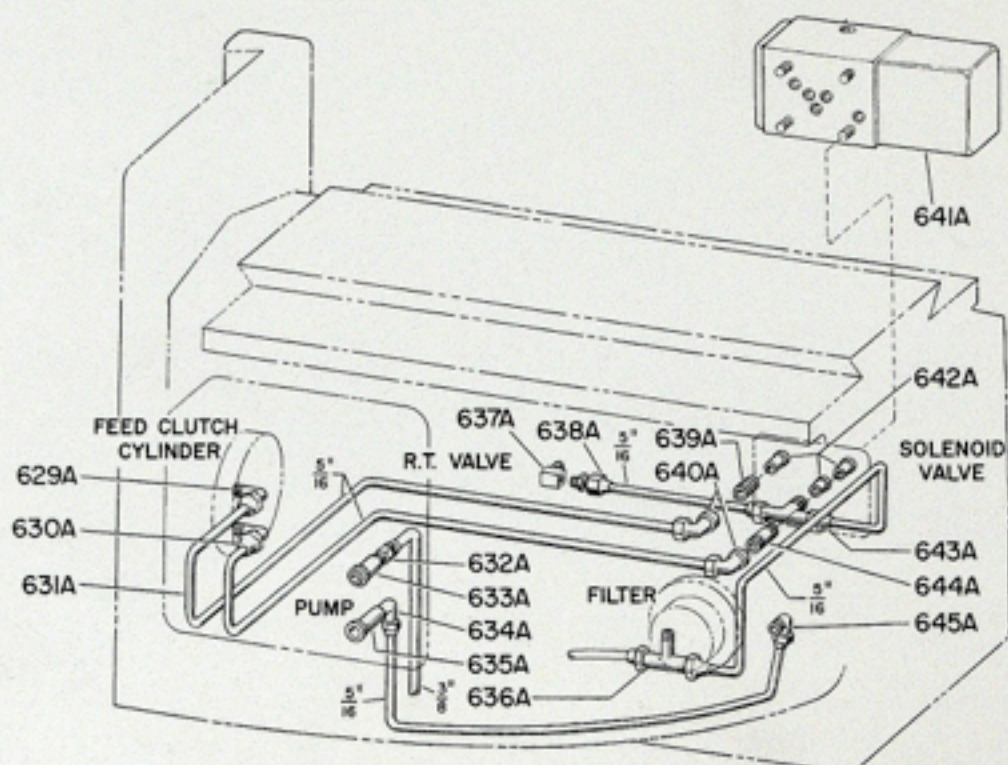
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

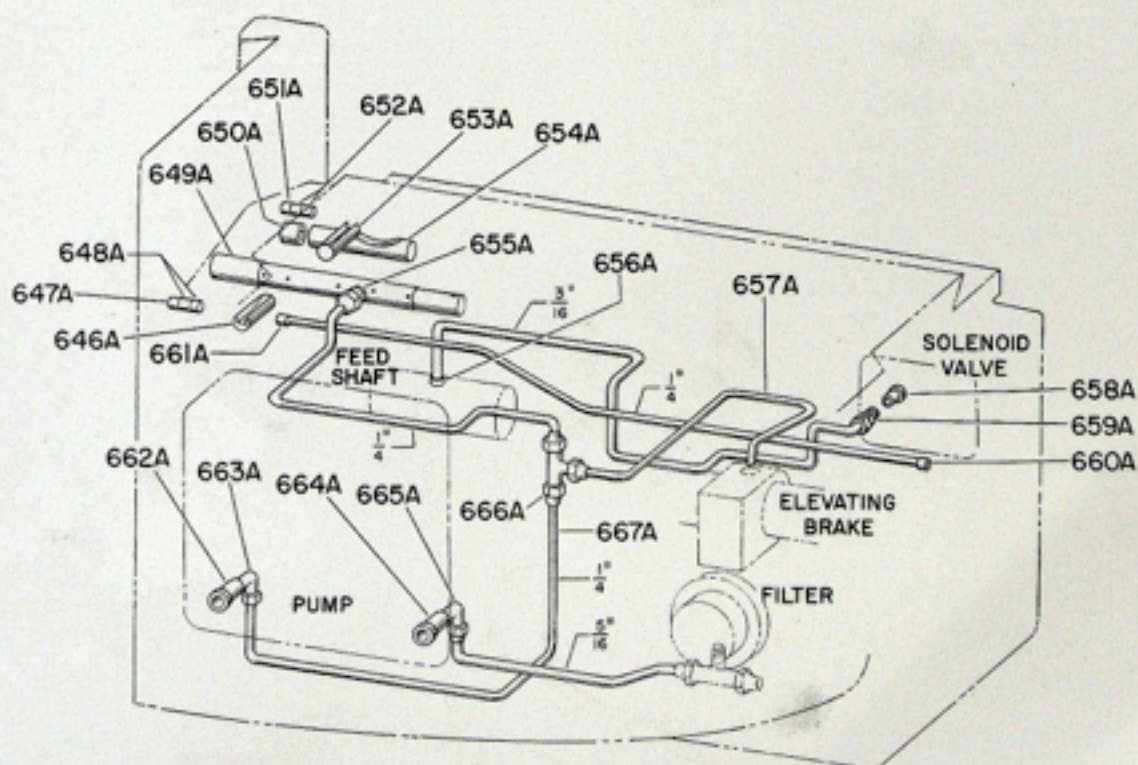
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-588A	3403	Screw	3	2JK-613A	4236	Plug - Pipe	2
2JK-589A	3215	Screw	1	2JK-614A	78600	Screw - Set	2
2JK-590A	1429	Pin	1	2JK-615A	3229	Screw - Set	2
2JK-591A	149601	Bracket - Pump (Without Rear Controls)	1	2JK-616A	142426	Gear - Pump Drive	1
2JK-592A	3163	Screw	2	2JK-617A		Gear - Feed Box Drive	
2JK-593A	233154	Pin	1		151602	2MI, 2ML Machines - 1/4 - 30 Feed	1
2JK-594A	78644	Plug - Pipe	3		151611	2MI, 2ML Machines - 1/2 - 60 Feed	1
2JK-595A	78644	Plug - Pipe	3		156578	3MI Machines - 1/4 - 30 Feed	1
2JK-596A	157092	Screw - Body Fit	2		156579	3MI Machines - 1/2 - 60 Feed	1
2JK-597A	105258	Cover - Pump - Front	1	2JK-618A	95585	Cone - Bearing	1
2JK-598A	157093	Spacer - Pump	1	2JK-619A	95586	Cup - Bearing	1
2JK-599A	42235	Screw	1	2JK-620A	95586	Cup - Bearing	1
2JK-600A	224645	Gasket	1	2JK-621A	95585	Cone - Bearing	1
2JK-601A	1911	Screw - Set	2	2JK-622A		Gear - Drive Shaft	
2JK-602A	138230	Spring	1		151600	2MI, 2ML Machines	1
2JK-603A	65913	Valve - Relief	1		146058	3MI Machines	1
2JK-604A	3158	Screw	8	2JK-623A	4242	Nut - Lock	1
2JK-605A	2123	Washer - Lock	10	2JK-624A	151614	Cover - Oil Filter	1
2JK-606A	157090	Pinion - Pump - Driver	1	2JK-625A	151599	Ring - "O"	1
2JK-607A	3279	Key	1	2JK-626A	121488	Spring - Oil Filter	1
2JK-608A	3496	Pin - Cotter	1	2JK-627A	121486	Element - Oil Filter	1
2JK-609A	157091	Pinion - Pump - Driven	1	2JK-628A		Plug - Oil Filter	
2JK-610A	142421	Bushing - Pump	1		151578	2MI, 2ML Machines	1
2JK-611A	142422	Bushing - Pump	1		157334	3MI Machines	1
2JK-612A	1844	Plug	2				

HYDRAULIC TUBING



434 RR
474 RR

LUBRICATION TUBING



175 RR
435 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

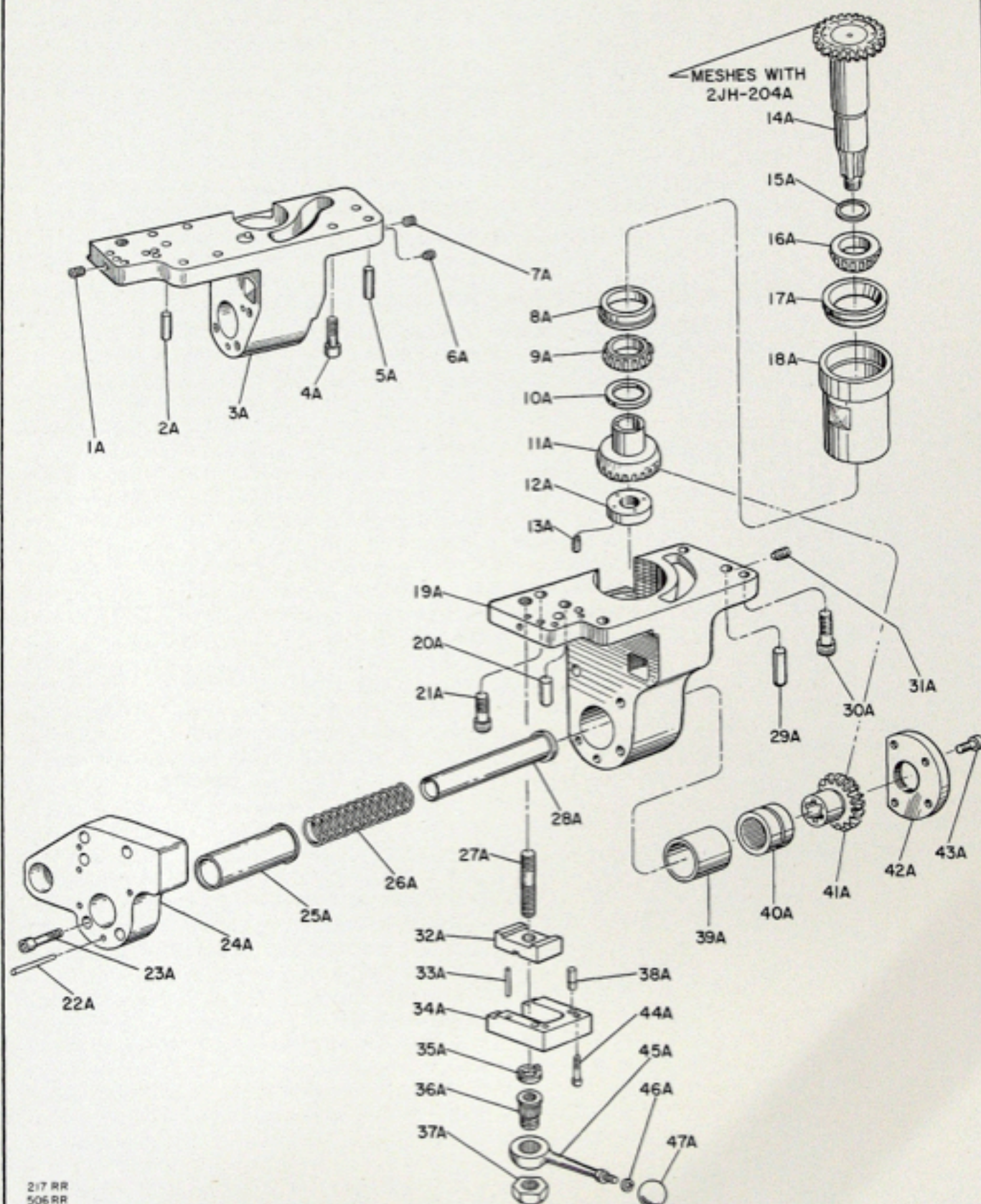
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Concluded)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JK-629A	4013	Fitting - Tubing - Elbow	1	2JK-650A	3549	Plug	1
2JK-630A	4013	Fitting - Tubing - Elbow	1	2JK-651A	74381	Plug - Restriction	1
2JK-631A		Tubing List		2JK-652A	1936	Plug - Felt	2
	156573	2MI, 2ML Plain and Universal Machines	1	2JK-653A	113471	Trough - Oil	1
	156574	2MI Vertical Machines	1	2JK-654A	111780	Trough - Oil	1
	157910	3MI Machines	1	2JK-655A	89866	Fitting - Tubing	1
2JK-632A	227170	Fitting - Tubing	1	2JK-656A	2190	Bushing - Tubing	1
2JK-633A	142595	Plug - Suction	1	2JK-657A		Tube - Spray	1
2JK-634A	4013	Fitting - Tubing - Elbow	1		156560	2MI, 2ML Plain and Universal Machines	1
2JK-635A	142594	Plug - Pressure	1		156599	2MI Vertical Machines	1
2JK-636A	218928	Fitting - Tubing - Tee	1		137147	3MI Machines	1
2JK-637A	159245	Adapter - Elbow	1	2JK-658A	151592	Bushing	1
2JK-638A	70382	Fitting - Tubing	1	2JK-659A	4014	Fitting - Tubing	1
2JK-639A	68119	Nipple - Pipe	1	2JK-660A	2190	Bushing - Tubing	1
2JK-640A	156729	Fitting - Tubing - Elbow	2	2JK-661A	2190	Bushing - Tubing	1
2JK-641A	156299	Valve - Solenoid	1	2JK-662A	142594	Plug - Pressure	1
2JK-642A	151592	Bushing	3	2JK-663A	58152	Fitting - Tubing - Elbow	1
2JK-643A	218298	Fitting - Tubing - Tee	1	2JK-664A	142594	Plug - Pressure	1
2JK-644A		Nipple - Pipe		2JK-665A	4013	Fitting - Tubing - Elbow	1
	104380	2MI, 2ML Machines	1	2JK-666A	64509	Fitting - Tubing - Tee	1
	36442	3MI Machines	1	2JK-667A		Tubing List	
2JK-645A	4013	Fitting - Tubing - Elbow	1		156573	2MI, 2ML Plain and Universal Machines	1
2JK-646A	113471	Trough - Oil	1		156574	2MI Vertical Machines	1
2JK-647A	74381	Plug - Restriction	1		157911	3MI Machines	1
2JK-648A	1936	Plug - Felt	2				
2JK-649A		Distributor - Oil					
	116057	2MI, 2ML Machines	1				
	113476	3MI Machines	1				

BRACKET UNDER SADDLE

217 RR
506 RR

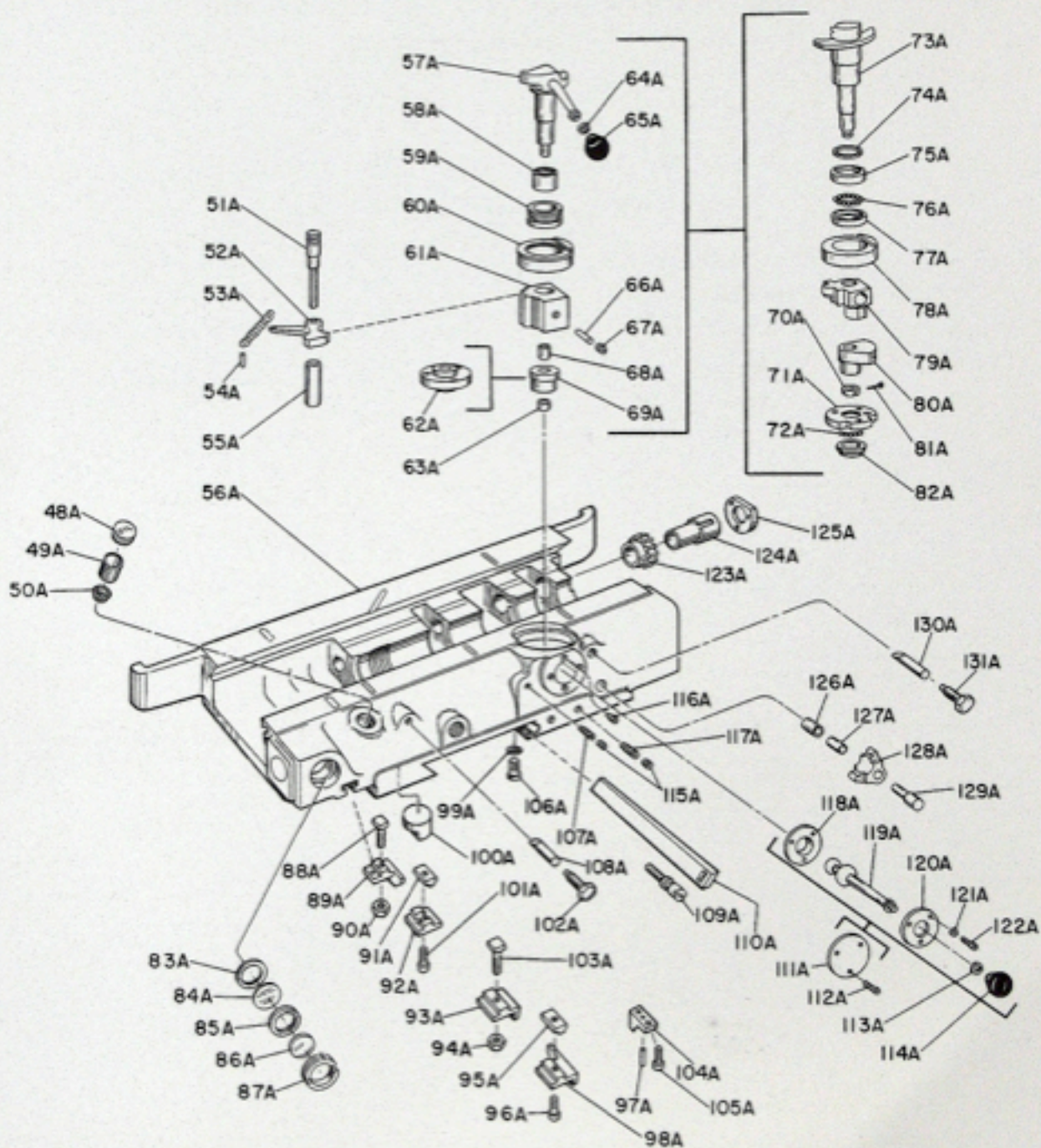
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-1A	3211	Screw - Set (3MI Machines Only)	1	2JH-19A	164020	Bracket - Under Saddle (2MI, 2ML Machines Only)	1
2JH-2A	1429	Pin - Short (3MI Machines Only)	1	2JH-20A	1586	Pin - Short (2MI, 2ML Machines Only)	1
2JH-3A	164019	Bracket - Under Saddle (3MI Machines Only)	1	2JH-21A	3403	Screw (2MI, 2ML Machines Only)	2
2JH-4A	3404	Screw (3MI Machines Only)	6	2JH-22A	2267	Pin - Taper	2
2JH-5A	1629	Pin - Long (3MI Machines Only)	1	2JH-23A	3248	Screw	5
2JH-6A	3232	Screw - Set (3MI Machines Only)	1	2JH-24A		Bracket - Cross Feed Nut	
2JH-7A	1917	Screw - Set (3MI Machines Only)	1		124677	2MI, 2ML Machines	1
2JH-8A		Cup - Bearing			134205	3MI Machines	1
	111030	2MI, 2ML Machines	1	2JH-25A		Cover - Spline Shaft	
	108271	3MI Machines	1		118310	2MI, 2ML Machines	1
2JH-9A		Cone - Bearing			112883	3MI Machines	1
	98776	2MI, 2ML Machines	1	2JH-26A	114057	Spring - Cover	1
	69189	3MI Machines	1	2JH-27A	164017	Stud - Clamping	1
2JH-10A		Washer - Stem Bevel Gear		2JH-28A		Extension - Spline Shaft Cover	
	116465	2MI, 2ML Machines	1		159584	2MI, 2ML Machines	1
	114065	3MI Machines	1		159585	3MI Machines	1
2JH-11A		Gear - Bevel		2JH-29A	1629	Pin - Long (2MI, 2ML Machines Only)	1
	116467	2MI, 2ML Machines	1	2JH-30A	3343	Screw	2
	128276	3MI Machines	1	2JH-31A	3232	Screw - Set	3
2JH-12A	111356	Nut - Bevel Gear	1	2JH-32A	164012	Clamp - Saddle	1
2JH-13A	1786	Screw - Set	1	2JH-33A	3277	Pin	1
2JH-14A		Gear - Stem Bevel		2JH-34A	164018	Housing - Clamp	1
	141323	2ML Plain, 2MI Plain and Vertical Machines	1	2JH-35A	164016	Clamp - Lower	1
	116504	2MI, 2ML Universal Machines	1	2JH-36A	164015	Nut - Clamping	1
	113450	3MI Plain Machines	1	2JH-37A	3351	Nut - Hex	1
	114131	3MI Universal Machines	1	2JH-38A	1664	Pin - Double Diameter	2
2JH-15A	114062	Washer - Fitting (3MI Machines Only)	1	2JH-39A	114055	Spacer - Bracket	1
2JH-16A		Cone - Bearing		2JH-40A	217655	Bearing - Needle	1
	98776	2MI, 2ML Machines	1	2JH-41A		Gear - Bracket Under Saddle	
	69189	3MI Machines	1		115412	2MI Machines	1
2JH-17A		Cup - Bearing			115415	3MI Machines	1
	111030	2MI, 2ML Machines	1	2JH-42A	111357	Cover - Bracket	1
	108271	3MI Machines	1	2JH-43A	3396	Screw	4
2JH-18A		Sleeve - Bevel Gear		2JH-44A	3397	Screw	2
	141322	2ML Plain, 2MI Plain and Vertical Machines	1	2JH-45A	164014	Lever - Clamp	1
	116507	2MI, 2ML Universal Machines	1	2JH-46A	2135	Washer - Lock	1
	128490	3MI Plain Machines	1	2JH-47A	115032	Ball - Handle	1
	128283	3MI Universal Machines	1				

SADDLE AND LINKAGE PLAIN AND VERTICAL MACHINES



218 RR
319 RR
321 RR
324 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

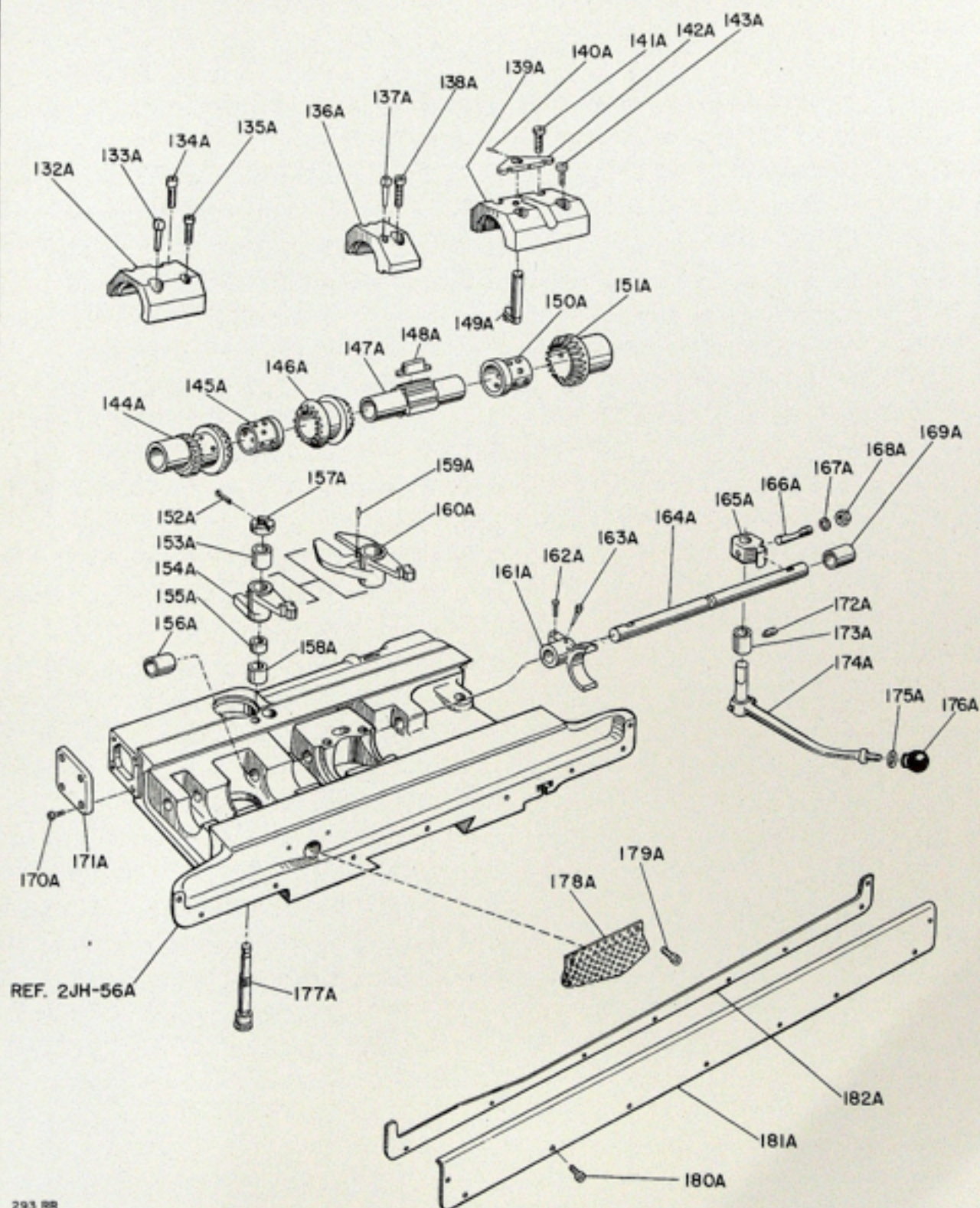
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used	
2JH-48A	3986	Cap - Oil Filler	1	2JH-85A	3849	Disc - Oil Gage	1	
2JH-49A	3912	Nipple - Oil Filler	1	2JH-87A	63937	Cover - Oil Gage	1	
2JH-50A	114051	Screen - Oil Filler	1	2JH-88A	3220	Bolt - Tee (Plain Machines Only)	1	
2JH-51A	141308	Stud - Eccentric	1	2JH-89A	120656	Dog - Stop (Plain Machines Only)	1	
2JH-52A	141310	Lever - Detent	1	2JH-90A	664	Nut - Hex (Plain Machines Only)	1	
2JH-53A	127893	Spring	1	2JH-91A	120657	Nut - Positive Stop	1	
2JH-54A	118176	Pin - Spring	1	2JH-92A	152525	Dog - Saddle Feed - Rear	1	
2JH-55A	141309	Bushing - Detent Lever Stud	1	2JH-93A	152524	Dog - Saddle Feed - Front	1	
2JH-56A		Saddle		2JH-94A	664	Nut - Hex	1	
	149289	2MI, 2ML Machines Without Backlash Eliminator	1	2JH-95A	120657	Nut - Positive Stop	1	
	156543	2MI, 2ML Machines With Backlash Eliminator	1	2JH-96A	3204	Screw	1	
	152569	3MI Machines Without Backlash Eliminator	1	2JH-97A	3636	Pin - Straight (2MI Vertical Machines Only)	1	
	156545	3MI Machines With Backlash Eliminator	1	2JH-98A	120623	Dog - Positive Stop - Outer	1	
2JH-57A		Lever - Table Feed Trip		2JH-99A	936	Washer - Round (With Backlash Eliminator)	3	
	142436	2MI, 2ML Machines Without Auto Table Cycle	1	2JH-100A	136924	Plug	1	
	142437	3MI Machines Without Auto Table Cycle	1	2JH-101A	3204	Screw	1	
2JH-58A	79763	Bearing - Needle (Without Auto Table Cycle)	1	2JH-102A	51	Screw - Hex Head Set	1	
2JH-59A	142425	Bushing - Trip Lever (Without Auto Table Cycle)	1	2JH-103A	3220	Bolt - Tee	1	
2JH-60A	142586	Plug - Upper Bearing Trip (Without Auto Table Cycle)	1	2JH-104A	120621	Dog - Saddle Rear Positive Stop (2MI Vertical Machines Only)	1	
2JH-61A	142434	Detent (Without Auto Table Cycle)	1	2JH-105A	3213	Screw (2MI Vertical Machines Only)	2	
2JH-62A	145093	Bushing - Trip Lever - Lower (2MI, 2ML Machines With Backlash Eliminator)	1	2JH-106A	3203	Screw (With Backlash Eliminator)	3	
2JH-63A	142587	Sleeve - Bearing Retainer	1	2JH-107A	3235	Screw - Set	1	
2JH-64A	2135	Washer - Lock (Without Auto Table Cycle)	1		64003	Shoe - Clamping	1	
2JH-65A	115032	Ball - Handle (Without Auto Table Cycle)	1		144372	2MI, 2ML Machines	1	
2JH-66A	647	Pin (Without Auto Table Cycle)	1	2JH-109A	35942	3MI Machines	1	
2JH-67A	1911	Screw - Set (Without Auto Table Cycle)	1	2JH-110A		Screw - Gib	1	
2JH-68A	76357	Bearing - Needle (Without Auto Table Cycle)	3		141320	Gib - Saddle	1	
2JH-69A	142424	Bushing - Trip Lever - Lower (Without Backlash Eliminator or Auto Table Cycle)	1		142427	2MI, 2ML Machines	1	
2JH-70A	141344	Nut - Feed Trip Plunger (With Auto Table Cycle)	1	2JH-111A	142818	3MI Machines	1	
2JH-71A	141304	Race - Ball - Lower Trip Plunger (With Auto Table Cycle)	1			Cover - Control Handle (Without Auto Table Cycle)	1	
2JH-72A	30060	Ball - Steel (With Auto Table Cycle)	17	2JH-112A	3219	Screw (Without Auto Table Cycle)	3	
2JH-73A	142660	Plunger - Feed Trip (With Auto Table Cycle)	1	2JH-113A	2135	Washer - Lock (With Auto Table Cycle)	1	
2JH-74A	118175	Ring - Felt - Trip Plunger (With Auto Table Cycle)	1	2JH-114A	115032	Ball - Handle (With Auto Table Cycle)	1	
2JH-75A	119893	Bush - Upper Feed Trip (With Auto Table Cycle)	1	2JH-115A	1917	Screw - Set	3	
2JH-76A	2290	Ball - Steel (With Auto Table Cycle)	30	2JH-116A	2344	Screw - Set	1	
2JH-77A	119894	Retainer - Bearing Ball (With Auto Table Cycle)	1	2JH-117A	3234	Screw - Set	2	
2JH-78A	147128	Plug - Trip Plunger Upper Bearing (With Auto Table Cycle)	1	2JH-118A	147125	Socket - Ball Handle (With Auto Table Cycle)	1	
2JH-79A		Eccentric and Feed Trip		2JH-119A	118235	Lever - Table Feed Trip (With Auto Table Cycle)	1	
	142659	2MI, 2ML Machines With Auto Table Cycle	1	2JH-120A	33321	Plate - Ball Handle (With Auto Table Cycle)	1	
2JH-80A	142661	3MI Machines With Auto Table Cycle	1	2JH-121A	2123	Washer (With Auto Table Cycle)	3	
2JH-81A	2095	Pin - Cotter (With Auto Table Cycle)	1	2JH-122A	3378	Screw (With Auto Table Cycle)	3	
2JH-82A	141303	Bush - Flange - Ball Race (With Auto Table Cycle)	1	2JH-123A		Gear - Attachment Driving		
2JH-83A	4086	Gasket - Oil Gage	1		116724	2MI, 2ML Machines	1	
2JH-84A	210271	Dial - Oil Gage	1		128483	3MI Machines	1	
2JH-85A	3850	Gasket - Oil Gage	1	2JH-124A		Sleeve - Attachment Gear	1	
					116723	2MI, 2ML Machines	1	
					128486	3MI Machines	1	
					111369	Washer - Attachment Gear	1	
					128479	2MI, 2ML Machines	1	
					141315	3MI Machines	1	
					2JH-126A	Bushing - (With Auto Table Cycle)	1	
					2JH-127A	Bushing - Oilite (With Auto Table Cycle)	1	
					2JH-128A	Lever - Rapid Traverse Valve (With Auto Table Cycle)	1	
					2JH-129A	Stud - Rapid Traverse Valve (With Auto Table Cycle)	1	
					2JH-130A	Shoe - Clamping	1	
						66437	2MI, 2ML Machines	1
						149876	3MI Machines	1
					2JH-131A	Screw - Hex Head Set	1	

LEADSCREW CLUTCH



293 RR
310 RR
313 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

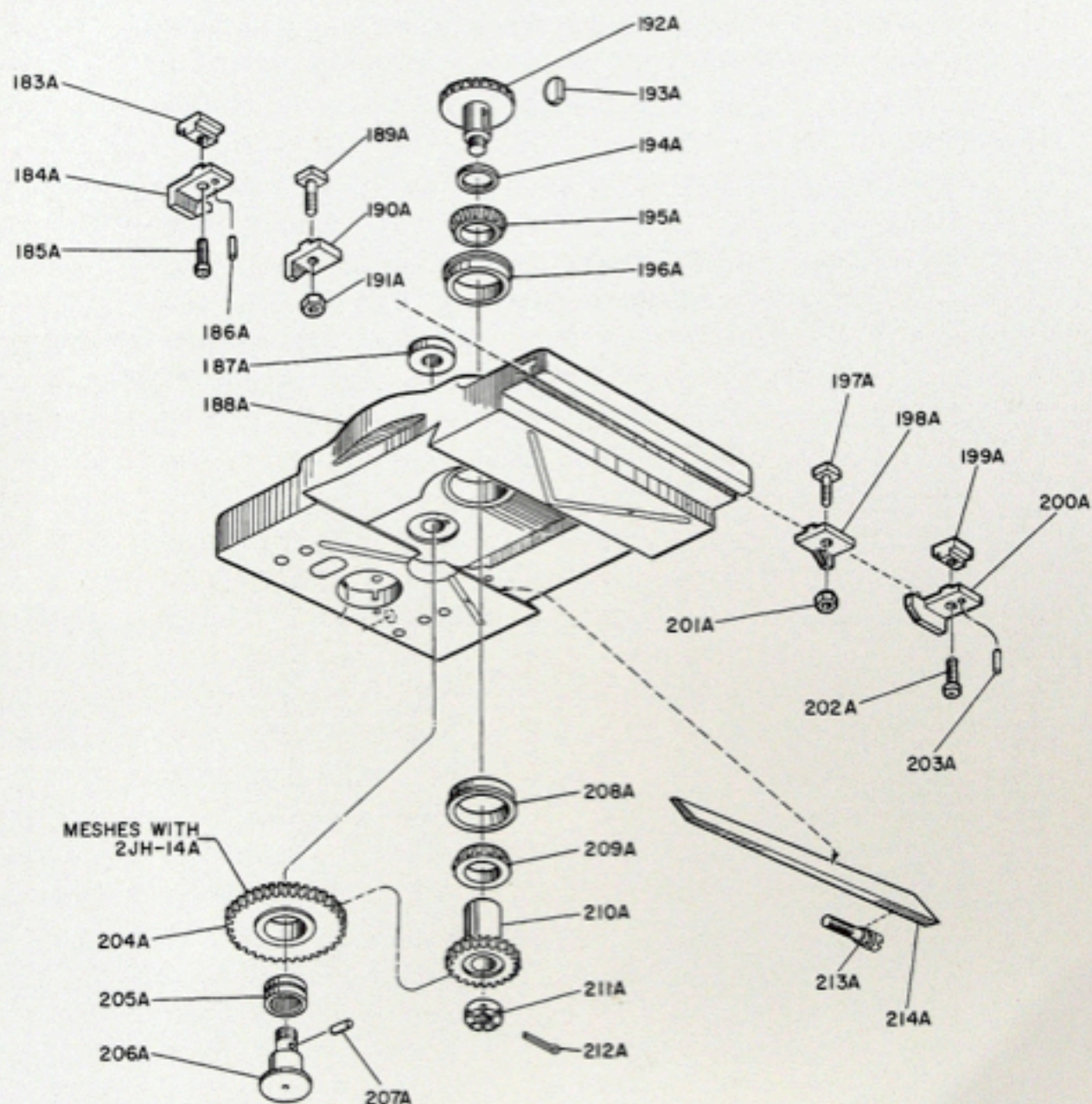
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-132A	116471	Cap - Bearing - Right	1	2JH-152A	3496	Pin - Cotter	1
	128489	2MI, 2ML Machines	1	2JH-153A	94978	Bearing - Needle	1
2JH-133A		3MI Machines	1	2JH-154A		Fork - Trip Lever	1
	111408	Pin - Taper	2		142433	2MI, 2ML Machines Without Auto Table Cycle	1
	83432	2MI, 2ML Machines	2		142432	3MI Machines Without Auto Table Cycle	1
2JH-134A	3248	3MI Machines	2	2JH-155A	141311	Spacer - Bearing	1
2JH-135A		Screw (3MI Machines Only)	2	2JH-156A	234231	Bushing	1
	2322	Screw	3	2JH-157A	141312	Nut - Lock	1
	3404	2MI, 2ML Machines	1	2JH-158A	94978	Bearing - Needle	1
2JH-136A		3MI Machines	1	2JH-159A	146022	Pin (With Auto Table Cycle)	1
	116473	Cap - Bearing - Middle	1	2JH-160A		Fork - Clutch Shifter	1
	114038	2MI, 2ML Machines	1		141314	2MI, 2ML Machines With Auto Table Cycle	1
2JH-137A	111408	3MI Machines	2		142430	3MI Machines With Auto Table Cycle	1
2JH-138A		Pin - Taper	2	2JH-161A		Fork - Clutch	1
	2322	Screw	2		141300	2MI, 2ML Machines	1
	3248	2MI, 2ML Machines	2		142435	3MI Machines	1
2JH-139A		3MI Machines	2	2JH-162A	3227	Screw	1
	156537	Cap - Bearing - Left	1	2JH-163A	14556	Pin - Taper	1
	156533	2MI, 2ML Machines Without Backlash Eliminator or Auto Table Cycle	1	2JH-164A		Rod - Clutch Shifter	1
	156540	2MI, 2ML Machines With Backlash Eliminator and Auto Table Cycle	1		156527	2MI, 2ML Machines	1
	156536	3MI Machines Without Backlash Eliminator or Auto Table Cycle	1		156528	3MI Machines	1
	156536	3MI Machines With Backlash Eliminator and Auto Table Cycle	1	2JH-165A		Lever - Rear Table Feed	1
2JH-140A	140	Pin - Taper	1		116512	2MI, 2ML Machines	1
2JH-141A		Screw	1		63507	3MI Machines	1
	107055	2MI, 2ML Machines	1	2JH-166A	33942	Pin - Wedge	1
	73090	3MI Machines	1	2JH-167A	2135	Washer - Lock	1
2JH-142A		Cam - Knockout	1	2JH-168A	2144	Nut - Hex	1
	156538	2MI, 2ML Machines	1	2JH-169A	234231	Bushing	1
	146303	3MI Machines	1	2JH-170A	3399	Screw	4
2JH-143A		Screw	1	2JH-171A	142420	Cover - End of Saddle	1
	3266	2MI, 2ML Machines	1	2JH-172A		Screw - Set	1
	3248	3MI Machines	1		3232	2MI, 2ML Machines	1
2JH-144A		Gear - Bevel - Right	1		3234	3MI Machines	1
	166366	2MI, 2ML Machines	1	2JH-173A	111382	Bushing	1
	166371	3MI Machines	1	2JH-174A		Shaft - Rear Control	1
2JH-145A	116466	Bushing - Bevel Gear	1		116510	2MI, 2ML Machines	1
2JH-146A		Clutch - Lead Screw	1		133366	3MI Machines	1
	154466	2MI, 2ML Machines	1	2JH-175A	2135	Washer - Lock	1
	63665	3MI Machines	1	2JH-176A	115032	Ball - Handle	1
2JH-147A		Sleeve - Lead Screw	1	2JH-177A	141313	Stud - Shifter Fork	1
	116468	2MI, 2ML Machines	1	2JH-178A		Strainer - Rear Saddle	1
	166373	3MI Machines	1		118291	2MI, 2ML Machines	1
2JH-148A		Key - Sleeve	1		128515	3MI Machines	1
	148785	2MI, 2ML Machines	1	2JH-179A	3202	Screw	2
	148788	3MI Machines	1	2JH-180A	3203	Screw	9
2JH-149A		Toggle - Table Handwheel Knockout	1	2JH-181A		Guard - Water	1
	156553	2MI, 2ML Machines	1		116441	2MI Machines	1
	146304	3MI Machines	1		118115	2ML Machines	1
2JH-150A	116466	Bushing - Bevel Gear	1		128492	3MI Machines	1
2JH-151A		Gear - Bevel - Left	1	2JH-182A		Gasket - Water Guard	1
	154489	2MI, 2ML Machines	1		116442	2MI, 2ML Machines	1
	128488	3MI Machines	1		128491	3MI Machines	1

UNIVERSAL SADDLE



164 RR
172 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

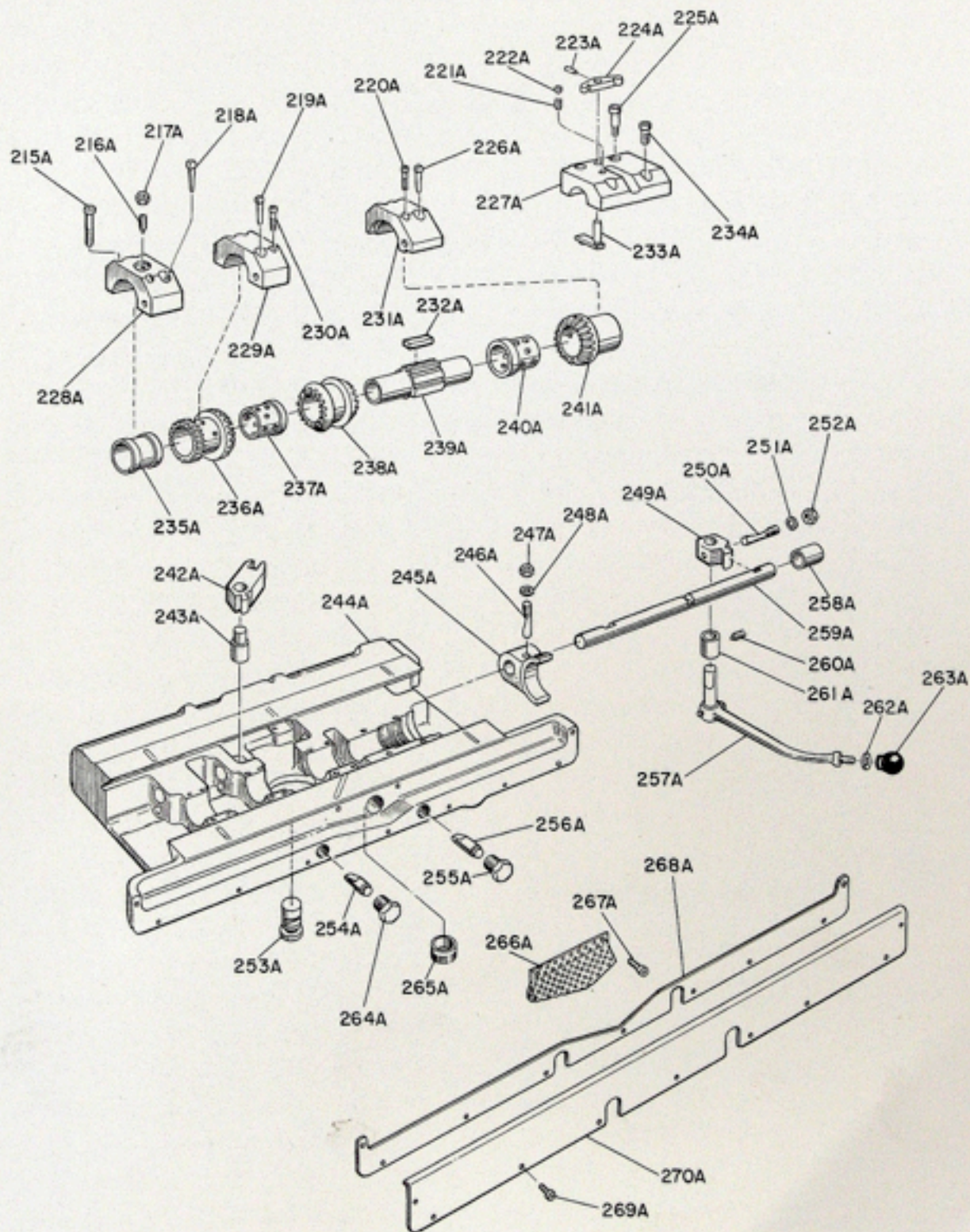
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-183A	120657	Nut - Positive Stop	1	2JH-201A	664	Nut - Hex	1
2JH-184A	120656	Dog - Positive Stop	1	2JH-202A	3204	Screw	1
2JH-185A	3204	Screw	1	2JH-203A	3636	Pin	1
2JH-186A	3636	Pin	1	2JH-204A		Gear - Idler	
2JH-187A	38270	Nut	1		127630	2MI, 2ML Machines	1
2JH-188A		Saddle - Universal			112805	3MI Machines	1
	116532	2MI, 2ML Machines	1	2JH-205A		Bearing - Needle	
	128288	3MI Machines	1		127631	2MI, 2ML Machines	1
2JH-189A	3220	Bolt - Tee	1		111136	3MI Machines	1
2JH-190A	120622	Dog - Saddle	1	2JH-206A		Stud - Idler Gear	
2JH-191A	664	Nut - Hex	1		114138	2MI, 2ML Machines	1
2JH-192A		Gear - Stem Bevel			112806	3MI Machines	1
	121101	2MI, 2ML Machines	1	2JH-207A	3636	Pin	1
	115495	3MI Machines	1	2JH-208A	108350	Cup - Bearing	1
2JH-193A	3281	Key	1	2JH-209A	108349	Cone - Bearing	1
2JH-194A		Washer - Fitting		2JH-210A		Gear - Sleeve	
	116463	2MI, 2ML Machines	1		116499	2MI, 2ML Machines	1
	114062	3MI Machines	1		115496	3MI Machines	1
2JH-195A	108349	Cone - Bearing	1	2JH-211A	111025	Nut - Slotted	1
2JH-196A	108350	Cup - Bearing	1	2JH-212A	3379	Pin - Cotter	1
2JH-197A	3220	Bolt - Tee	1	2JH-213A	35942	Screw - Gib	1
2JH-198A	120624	Dog - Saddle Feed - Front	1	2JH-214A		Gib - Saddle	
2JH-199A	120657	Nut - Positive Stop	1		111405	2MI, 2ML Machines	1
2JH-200A	120623	Dog - Outer Positive Stop	1		115498	3MI Machines	1

UNIVERSAL HOUSING



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

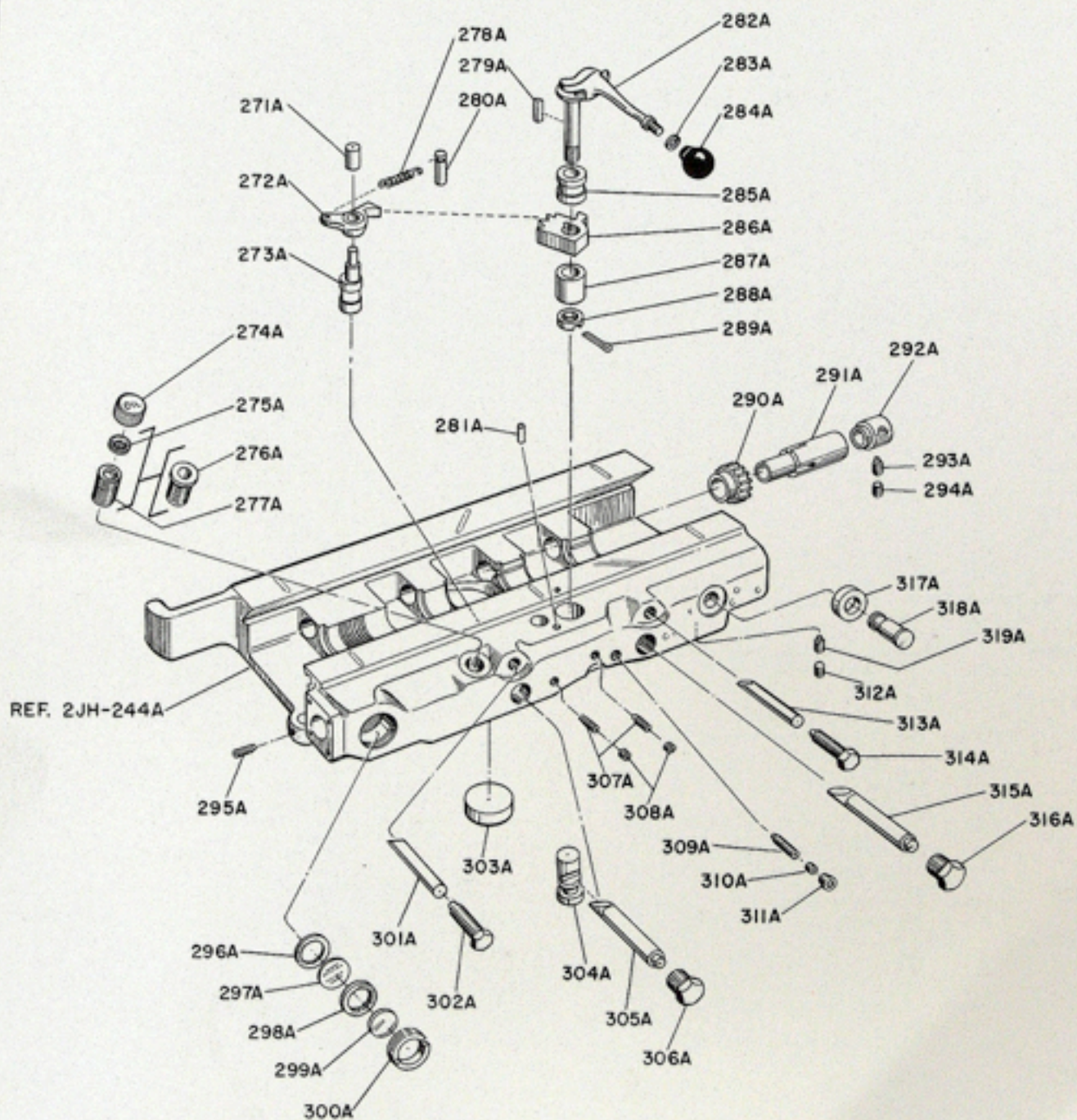
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

UNIVERSAL MACHINES

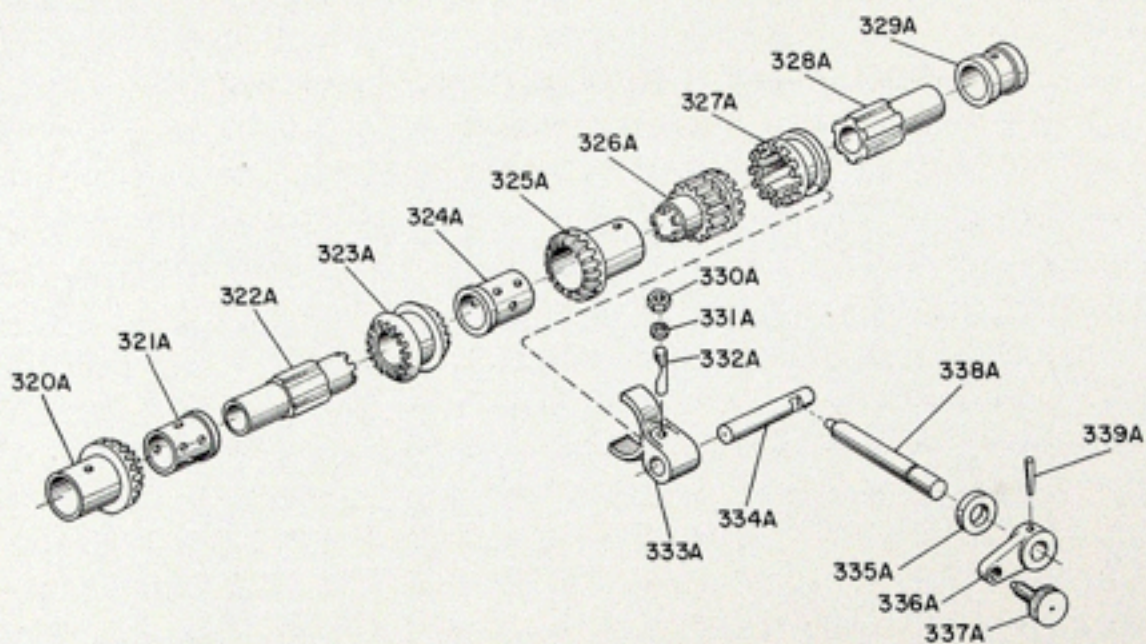
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-215A		Screw		2JH-243A		Stud - Lever	
	2322	2MI, 2ML Machines	2		111364	2MI, 2ML Machines	1
	3248	3MI Machines	2		63496	3MI Machines	1
2JH-216A	216	Screw - Set	1	2JH-244A		Housing - Saddle	
2JH-217A	156	Nut - Hex	1		156542	2MI Machines Without Backlash Eliminator	1
2JH-218A		Pin - Taper			152566	2MI Machines With Backlash Eliminator	1
	111408	2MI, 2ML Machines	2		156241	2ML Machines Without Backlash Eliminator	1
	83432	3MI Machines	2		152563	2ML Machines With Backlash Eliminator	1
2JH-219A	111408	Pin - Taper	2		156550	3MI Machines Without Backlash Eliminator	1
2JH-220A	2322	Screw	2		156571	3MI Machines With Backlash Eliminator	1
2JH-221A	2322	Screw - Set	1	2JH-245A		Fork - Clutch	
2JH-222A	2356	Screw - Set	1		120698	2MI, 2ML Machines	1
2JH-223A	140	Pin - Taper	1		111585	3MI Machines	1
2JH-224A		Cam - Knockout			38368	Pin - Lock	1
	156538	2MI, 2ML Machines	1		842	Nut - Hex	1
	146303	3MI Machines	1		2038	Washer - Lock	1
2JH-225A	107055	Screw - Shoulder	2	2JH-246A		Lever - Rear Table Feed	
2JH-226A	111408	Pin - Taper	2		116512	2MI, 2ML Machines	1
2JH-227A		Cap - Bearing - Left			63507	3MI Machines	1
	156537	2MI, 2ML Machines	1		33942	Pin - Lock	1
	156540	3MI Machines Without Backlash Eliminator	1		2135	Washer - Lock	1
	156536	3MI Machines With Backlash Eliminator	1		2144	Nut - Hex	1
2JH-228A		Cap - Bearing - Right		2JH-250A		Clamp - Saddle Housing	2
	116514	2MI, 2ML Machines	1		2JH-251A	Wedge - Rear Clamping	
	114135	3MI Machines	1		116522	2MI, 2ML Machines	1
2JH-229A		Cap - Bearing - Right Center			115499	3MI Machines	1
	116513	2MI, 2ML Machines	1	2JH-255A		Screw - Rear Saddle Clamp	
	128285	3MI Machines	1		116523	2MI, 2ML Machines	1
2JH-230A	2322	Screw	2		65076	3MI Machines	1
2JH-231A		Cap - Bearing - Left Center			116522	Wedge - Rear Clamping	
	116473	2MI, 2ML Machines	1		115499	3MI Machines	1
	114038	3MI Machines	1	2JH-256A		Shaft - Rear Control	
2JH-232A		Key			116510	2MI, 2ML Machines	1
	96032	2MI, 2ML Machines	1		134248	3MI Machines	1
	74123	3MI Machines	1	2JH-258A		Bushing	
2JH-233A		Toggle - Table Handwheel Knockout			3832	Rod - Clutch Shifter	
	156553	2MI, 2ML Machines	1		149296	2MI, 2ML Machines	1
	146304	3MI Machines	1		156529	3MI Machines	1
2JH-234A	3266	Screw	2	2JH-260A		Screw - Set	
2JH-235A		Bushing - Lead Screw			111382	Bushing - Rear Control Shaft	1
	121506	2MI, 2ML Machines Without Short Lead Attachment	1	2JH-262A		Washer - Lock	1
	136965	3MI Machines Without Short Lead Attachment	1	2JH-263A		Ball - Handle	1
2JH-236A		Gear - Bevel - Right			115032	Screw - Rear Saddle Clamp	
	166367	2MI, 2ML Machines Without Short Lead Attachment	1	2JH-264A		2MI, 2ML Machines	1
	166372	3MI Machines Without Short Lead Attachment, With Backlash Eliminator	1		116523	3MI Machines	1
2JH-237A		Bushing - Bevel Gear		2JH-265A		Nipple - Saddle	
	116466	2MI, 2ML Machines	1		116503	2MI, 2ML Machines	1
	63680	3MI Machines	1		66994	3MI Machines	1
2JH-238A		Clutch - Lead Screw		2JH-266A		Strainer - Rear Housing	
	166364	2MI, 2ML Machines	1		118292	2MI, 2ML Machines	1
	166369	3MI Machines	1		128287	3MI Machines	1
2JH-239A		Sleeve - Lead Screw		2JH-267A		Screw	2
	116468	2MI, 2ML Machines Without Short Lead Attachment	1	2JH-268A		Gasket - Water Guard	
	166373	3MI Machines Without Short Lead Attachment	1		116517	2MI, 2ML Machines	1
2JH-240A		Bushing - Bevel Gear			134244	3MI Machines	1
	116466	2MI, 2ML Machines	1	2JH-269A		Screw	
	63680	3MI Machines	1		3203	2MI, 2ML Machines	9
2JH-241A		Gear - Bevel - L. H.			3203	3MI Machines	12
	166365	2MI, 2ML Machines	1	2JH-270A		Guard - Water	
	128488	3MI Machines	1		116516	2MI Machines	1
2JH-242A		Lever - Clutch Shifter			118287	2ML Machines	1
	116525	2MI, 2ML Machines	1		134243	3MI Machines	1
	112907	3MI Machines	1				

CONTROL LINKAGE



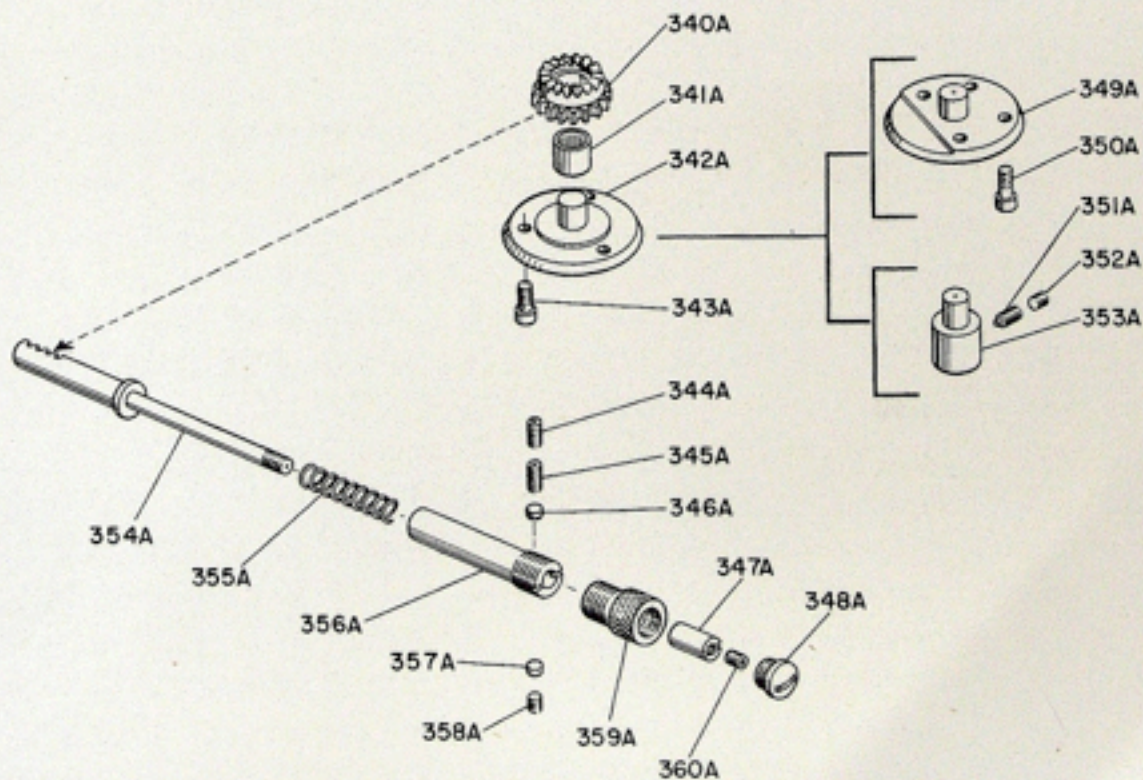
172 RR
178 RR

SHORT LEAD ATTACHMENT



164 RR

BACKLASH ELIMINATOR



172 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

UNIVERSAL MACHINES

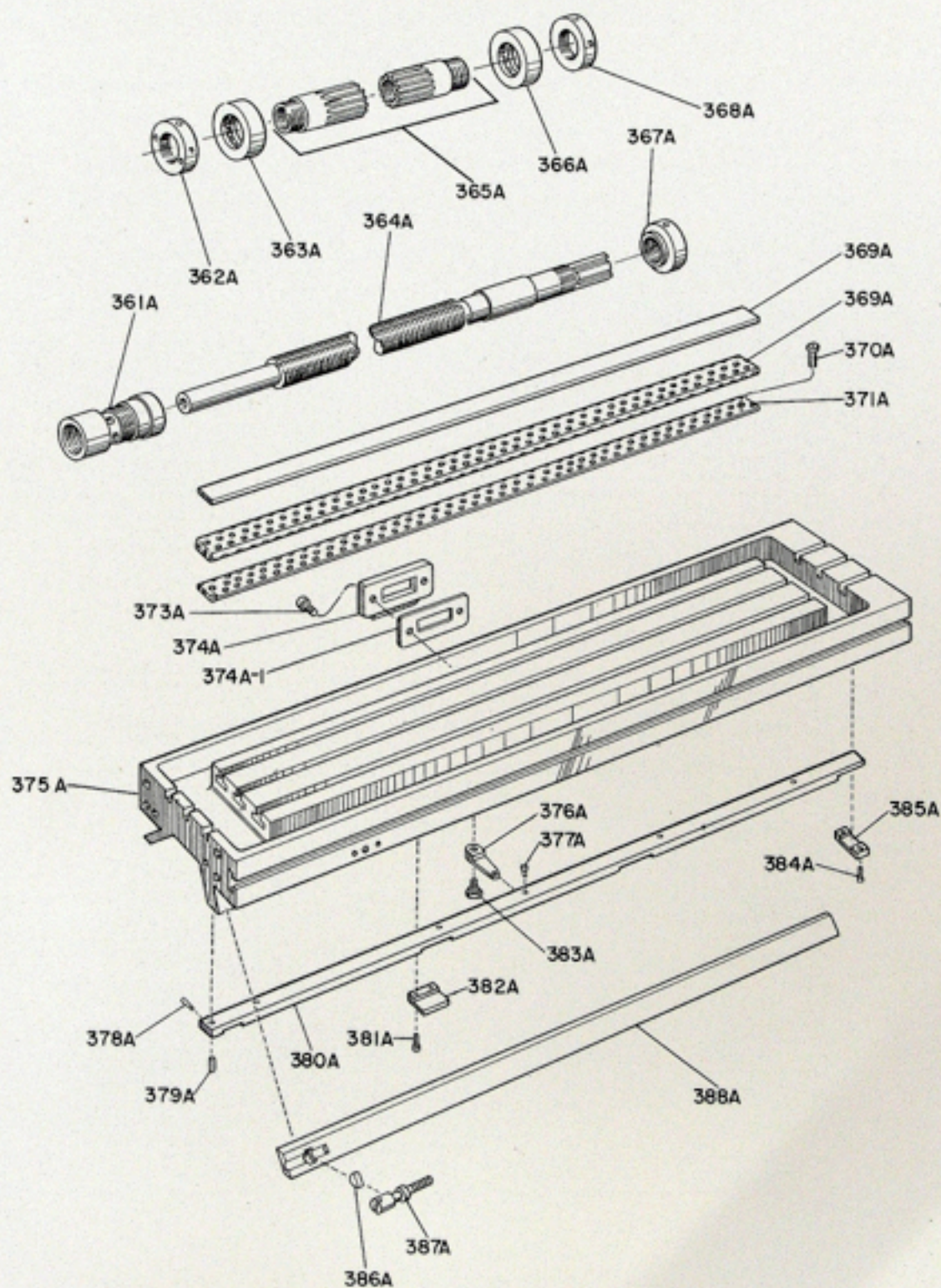
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-320A		Gear - Bevel - L. H.		2JH-328A		Sleeve - Lead Screw - Short	
	154469	2MI, 2ML Machines	1		116520	2MI, 2ML Machines	1
	166370	3MI Machines	1		115534	3MI Machines	1
2JH-321A		Bushing		2JH-329A		Bushing - Lead Screw	
	116466	2MI, 2ML Machines	1		116702	2MI, 2ML Machines	1
	63680	3MI Machines	1		136964	3MI Machines	1
2JH-322A		Sleeve - Lead Screw - Long		2JH-330A	842	Nut - Hex	1
	116528	2MI, 2ML Machines	1	2JH-331A	2038	Washer - Lock	1
	166374	3MI Machines	1	2JH-332A	38368	Pin - Lock	1
2JH-323A		Clutch		2JH-333A		Fork - Clutch	
	166364	2MI, 2ML Machines	1		120699	2MI, 2ML Machines	1
	166369	3MI Machines	1		111585	3MI Machines	1
2JH-324A		Bushing		2JH-334A		Rod - Clutch Shifter	
	116466	2MI, 2ML Machines	1		116549	2MI, 2ML Machines	1
	63680	3MI Machines	1		128280	3MI Machines	1
2JH-325A		Gear - Bevel - R. H.		2JH-335A	114133	Washer - Shifter Lever	1
	166368	2MI, 2ML Machines	1	2JH-336A	76745	Lever - Eccentric Shaft	1
	166370	3MI Machines	1	2JH-337A	75393	Screw - Change Lever	1
2JH-326A		Gear - Driving Attachment		2JH-338A		Shaft - Eccentric	
	116519	2MI, 2ML Machines	1		126711	2MI, 2ML Machines	1
	128284	3MI Machines	1		112809	3MI Machines	1
2JH-327A		Clutch - Lead Screw		2JH-339A	143	Pin - Taper	1
	116518	2MI, 2ML Machines	1				
	73827	3MI Machines	1				

SADDLE TABLE — UNIT No. 2JH (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-340A		Gear - Back Lash Eliminator Crown		2JH-350A	3213	Screw (3MI Universal Machines Only) . .	4
	97575	2MI, 2ML Machines	1	2JH-351A	3235	Screw - Set (3MI Plain Machines Only) .	1
	109225	3MI Machines	1	2JH-352A	1917	Screw - Set (3MI Plain Machines Only) .	1
2JH-341A		Bearing - Needle	1	2JH-353A	114061	Support - Bearing (3MI Plain Machines Only)	1
2JH-342A	103171	Support - Bearing (2MI, 2ML Machines Only)	1	2JH-354A		Rack - Back Lash Eliminator	
					111388	2MI, 2ML Machines	1
2JH-343A	3213	Screw (2MI, 2ML Machines Only)	3		112810	3MI Machines	1
2JH-344A	3211	Screw - Set (2MI, 2ML Plain, 3MI Plain and Universal)	1	2JH-355A	131172	Spring	1
2JH-345A	3234	Screw - Set (2MI, 2ML Plain, 3MI Plain and Universal)	1	2JH-356A	104243	Cage - Spring	1
2JH-346A	1962	Plug (2MI, 2ML Plain, 3MI Plain and Universal)	1	2JH-357A	2268	Plug (2MI, 2ML Universal Machines Only) .	1
				2JH-358A	1911	Screw - Set (2MI, 2ML Universal Machines Only)	1
2JH-347A	104242	Stop - Bushing	1	2JH-359A		Knob - Backlash Eliminator	
2JH-348A	902	Screw	1		111389	2MI, 2ML Machines	1
2JH-349A	109371	Support - Bearing (3MI Universal Machines Only)	1		108353	3MI Machines	1
				2JH-360A	1911	Screw - Set	1

TABLE, LEADSCREW, AND BACKLASH NUTS



164 RR
293 RR
436 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

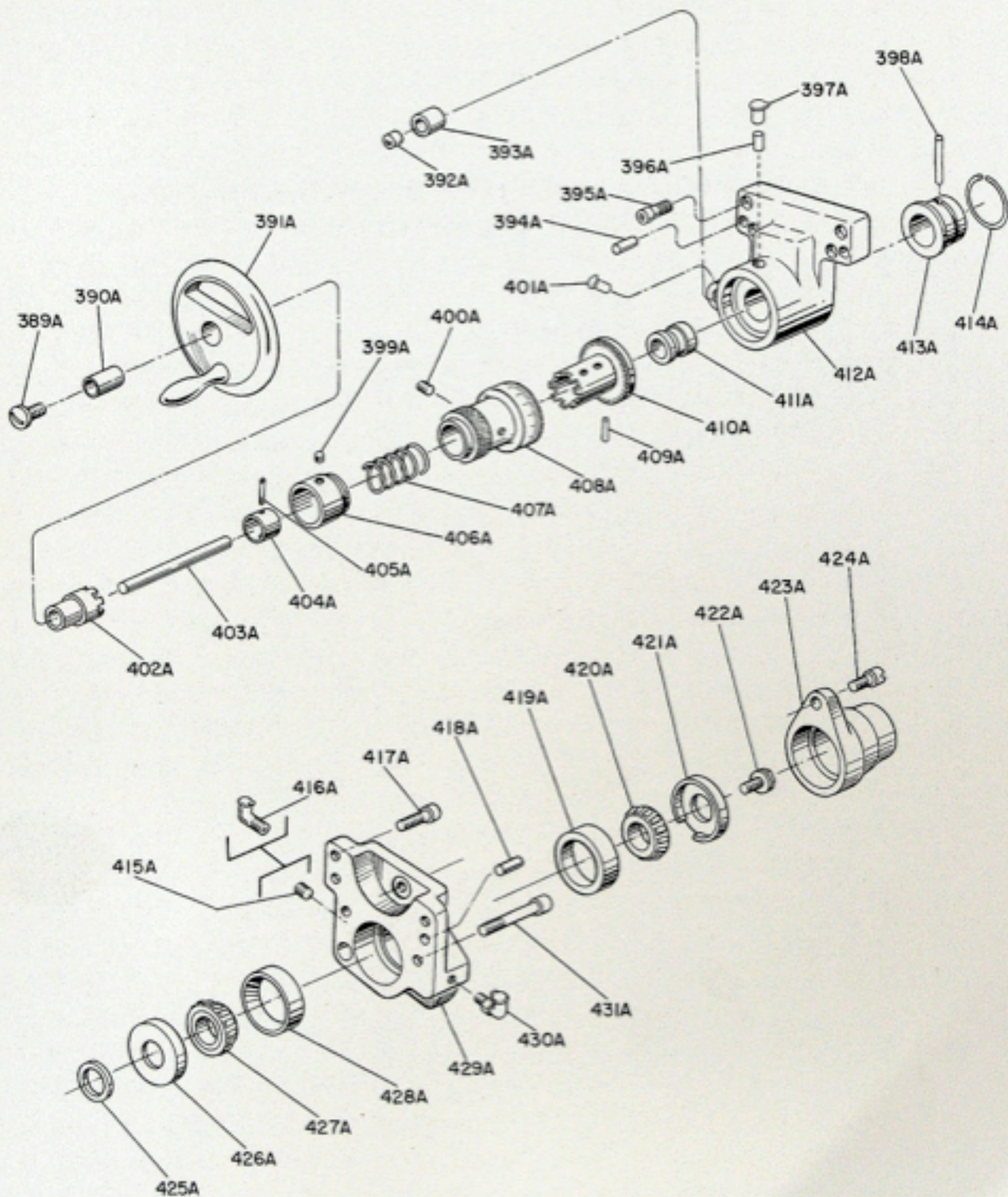
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-361A	111341	Nut - Lead Screw		2JH-373A	3395	Screw	2
	120536	2MI, 2ML Machines Without Backlash Eliminator	1	2JH-374A	141392	Spout - Coolant Return	1
2JH-362A	4191	3MI Machines Without Backlash Eliminator	1	2JH-374A-1	104503	Gasket - Coolant Return Spout	1
	4194	Nut - Lock		2JH-375A		Table	
2JH-363A	125347	2MI, 2ML Machines With Backlash Eliminator	1		156546	2ML Plain	1
	98622	3MI Machines With Backlash Eliminator	1		156554	2ML Plain W/Auto Cycle	1
2JH-364A	152567	Screw - Lead			156570	2ML Universal	1
	152556	2MI, 2ML Machines With Backlash Eliminator	1		156557	2MI Plain and Vertical	1
	156548	2MI, 2ML Machines Without Backlash Eliminator	1		156555	2MI Plain and Vertical W/Auto Cycle	1
	156551	3MI Machines With Backlash Eliminator	1		156556	2MI Universal	1
2JH-365A	148111	3MI Machines Without Backlash Eliminator	1	2JH-376A	156544	3MI Plain W/Auto Cycle	1
	148117	Screw - Lead			156569	3MI Plain and Universal	1
2JH-366A	125347	2MI, 2ML Machines With Backlash Eliminator	1		149297	Link - Knockout	
	98622	3MI Machines With Backlash Eliminator	1		155051	2MI, 2ML Machines	1
2JH-367A	104080	Nut - Lock		2JH-377A		3MI Machines	1
	100573	2MI, 2ML Machines	1		160288	Pin - Double Diameter	
2JH-368A	4191	3MI Machines	1		160288	2MI, 2ML Machines	4
	4194	3MI Machines With Backlash Eliminator	1	2JH-378A	140	3MI Machines	5
2JH-369A	116458	Nut - Lead Screw		2JH-379A		Pin - Taper	1
	133358	2MI, 2ML Machines With Backlash Eliminator	1		156539	Pin - In Bar	
2JH-370A	116118	3MI Machines With Backlash Eliminator	1		154949	2MI, 2ML Machines	1
	133362	Cover - Strainer		2JH-380A		3MI Machines	1
2JH-371A	1681	2MI, 2ML Machines	1		156532	Bar - Knockout	
2JH-372A	116117	3MI Machines	1		156531	2MI, 2ML Machines	1
	63789	3MI Machines With Backlash Eliminator	1	2JH-381A		3MI Machines	1
					3204	Screw	
					3204	2MI, 2ML Machines	2
				2JH-382A		3MI Machines	4
					154944	Strap - Bar Support	
					154944	2MI, 2ML Machines	1
				2JH-383A		3MI Machines	2
					155053	Stud - Link	
					155053	2MI, 2ML Machines	4
				2JH-384A		3MI Machines	5
				2JH-385A		Screw	
					156561	Strap - Bar Support	
					154945	2MI, 2ML Machines	2
				2JH-386A	626	3MI Machines	2
				2JH-387A	35942	Key	1
				2JH-388A		Screw - Gib	1
					39605	Gib - Table	
					146733	2MI, 2ML Machines	1
					115497	3MI Plain Machines	1
						3MI Universal Machines	1

TABLE APRONS



433 RR
436 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-389A	3514	Screw - Retaining	1	2JH-414A	105154	Ring - Retaining	1
2JH-390A	161002	Sleeve - Handwheel	1	2JH-415A	76644	Plug - Pipe (Without Short Lead Attachment)	1
2JH-391A	161083	Handwheel	1	2JH-416A	124593	Oiler (2MI, 2ML Machines Without Short Lead Attachment)	1
2JH-392A	40553	Oiler (3MI Machines With Short Lead Attachment Only)	1	2JH-417A		Screw	1
2JH-393A	128267	Plug - Front Apron (3MI Machines With Short Lead Attachment Only)	1		3343	2MI, 2ML Machines	2
2JH-394A		Pin	1		3404	3MI Machines	2
	1664	2MI, 2ML Machines	2	2JH-418A		Pin	1
	1429	3MI Machines	2		1429	2MI, 2ML Machines	2
2JH-395A		Screw	1		1429	3MI Machines	4
	3403	2MI, 2ML Machines	4	2JH-419A		Cup - Bearing	1
	3343	3MI Machines	4		116457	2MI, 2ML Machines	1
2JH-396A		Plug - Felt	1		114593	3MI Machines	1
	1936	2MI, 2ML Machines	1	2JH-420A		Cone - Bearing	1
	2251	3MI Machines	1		116456	2MI, 2ML Machines	1
2JH-397A	51737	Oiler	1		114594	3MI Machines	1
2JH-398A	160457	Pin - Knockout	1	2JH-421A		Retainer - Back Apron	1
2JH-399A	3232	Screw	1		116464	2MI, 2ML Machines	1
2JH-400A	102852	Plug	1		109155	3MI Machines	1
2JH-401A	44980	Oiler (2MI, 2ML Machines With Short Lead Attachment)	1	2JH-422A	2054	Screw	1
2JH-402A	161084	Clutch - Handwheel	1	2JH-423A	108336	Cover - Back Apron	1
2JH-403A		Rod - Knockout	1	2JH-424A	3417	Screw	1
	156524	2MI, 2ML Machines	1	2JH-425A	114714	Washer (3MI Machines Only)	1
	156525	3MI Machines	1	2JH-426A		Retainer - Back Apron	1
2JH-404A	66249	Collar - Small	1		116464	2MI, 2ML Machines	1
2JH-405A	66254	Pin - In Collar - Short	1		114713	3MI Machines	1
2JH-406A	156534	Bushing - Spring Retainer	1	2JH-427A		Cone - Bearing	1
2JH-407A	102083	Spring	1		116456	2MI, 2ML Machines	1
2JH-408A	152552	Dial - Lead Screw	1		114594	3MI Machines	1
2JH-409A	663	Pin - Taper	2	2JH-428A		Cup - Bearing	1
2JH-410A	149299	Clutch - Lead Screw Dial	1		116457	2MI, 2ML Machines	1
2JH-411A	127487	Bushing - Front Apron	1		114593	3MI Machines	1
2JH-412A		Apron - Front	1	2JH-429A		Apron - Rear	1
	116115	2MI, 2ML Machines	1		158832	2MI, 2ML Machines	1
	156530	3MI Machines	1		158859	3MI Machines	1
2JH-413A		Collar - Flanged	1	2JH-430A	124593	Oiler	1
	152593	2MI, 2ML Machines	1	2JH-431A	3322	Screw	2
	156526	3MI Machines	1				

TABLE DOGS WITHOUT AUTOMATIC TABLE CYCLE

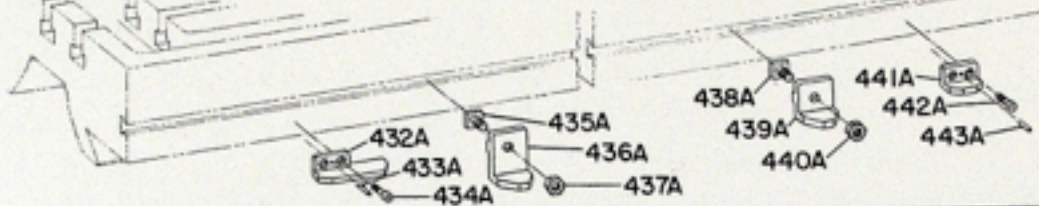
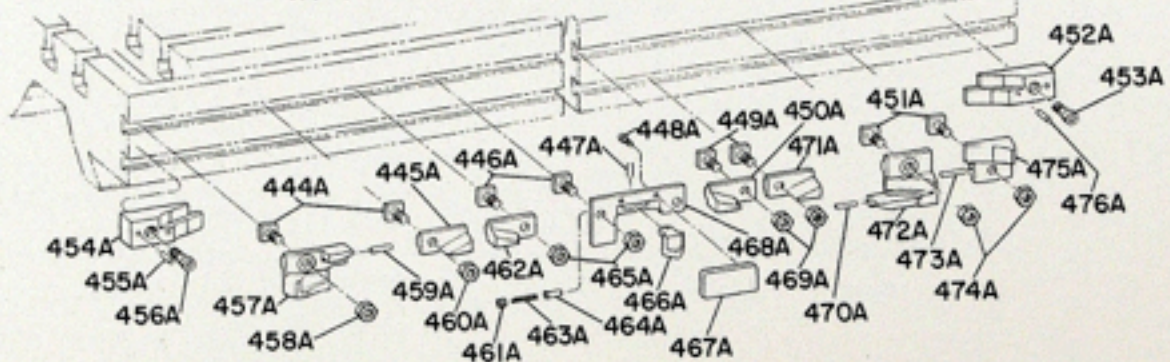
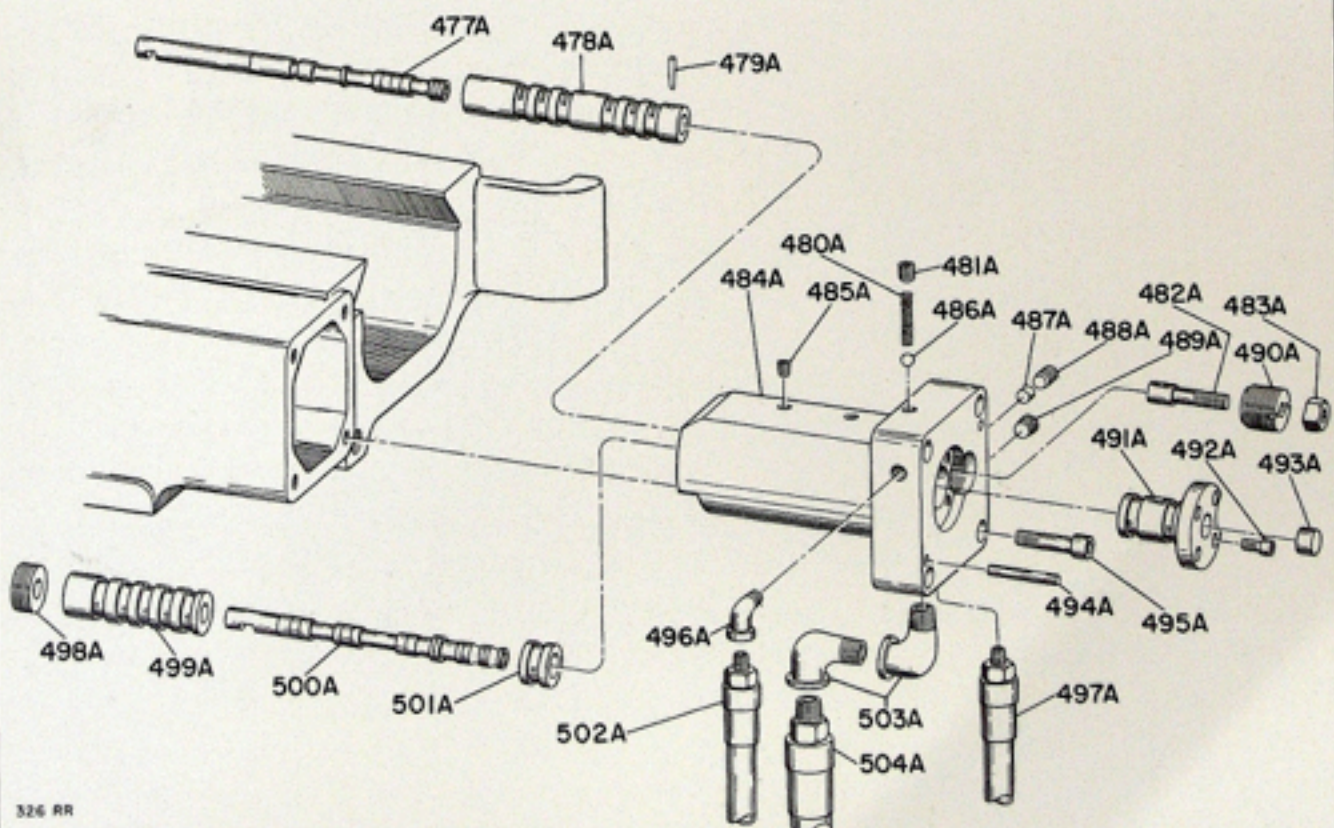


TABLE DOGS WITH AUTOMATIC TABLE CYCLE



AUTOMATIC TABLE CYCLE VALVE



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

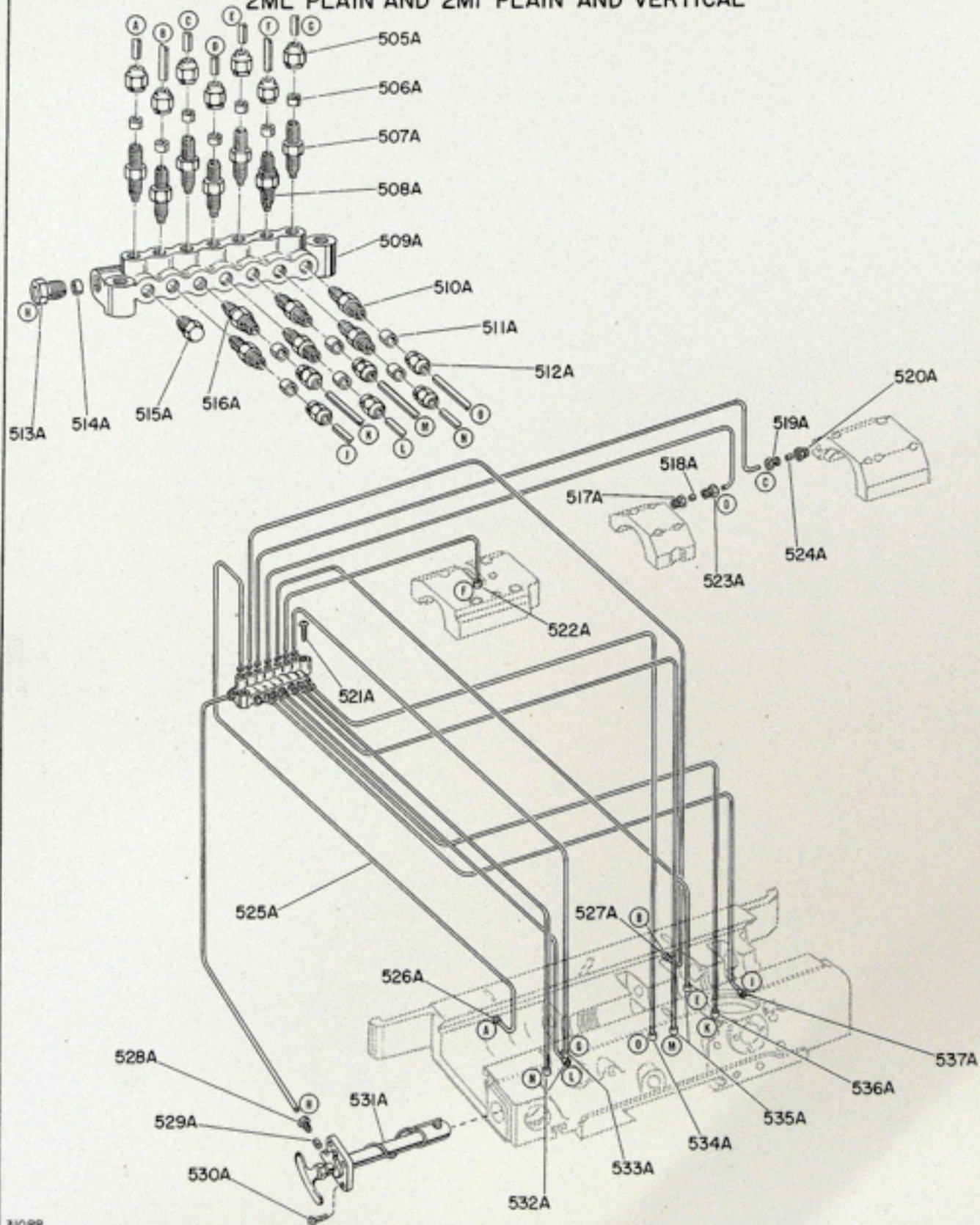
SADDLE TABLE — UNIT No. 2JH (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-432A	128161	Dog - Positive Stop - L. H.	1	2JH-470A	3285	Pin (With Auto Table Cycle)	1
	104499	2ML Universal Machines Only	1	2JH-471A	108532	Dog - L. H. (With Auto Table Cycle)	1
		Plain and Vertical Machines Without		2JH-472A	140736	Dog - Reverse Rate - R. H. (With Auto	
		Auto Table Cycle, 2MI and 3MI				Table Cycle)	1
		Universal Machines	1	2JH-473A	3277	Pin (With Auto Table Cycle)	1
2JH-433A	3636	Pin - Taper	1	2JH-474A	664	Nut - Hex	2
2JH-434A	3203	Screw	2	2JH-475A	157991	Dog - Rapid Traverse (With Auto Table	
2JH-435A	3220	Bolt - Tee	1			Cycle)	1
2JH-436A		Dog - Feed - L. H.		2JH-476A	3162	Pin (With Auto Table Cycle)	2
	128159	2ML Universal Machines Only	1	2JH-477A	141337	Plunger - Spindle Stop Valve (With Auto	
	115453	Plain and Vertical Machines Without				Table Cycle and Spindle Stop)	1
		Auto Table Cycle, 2MI and 3MI		2JH-478A	142817	Bushing - Spindle Stop Valve (With Auto	
		Universal Machines	1			Table Cycle and Spindle Stop)	1
2JH-437A	664	Nut - Hex	1	2JH-479A	140	Pin - Taper	1
2JH-438A	3220	Bolt - Tee	1	2JH-480A	70407	Spring (With Auto Table Cycle)	1
2JH-439A		Dog - Feed - R. H.		2JH-481A	1911	Screw - Set	1
	128158	2ML Universal Machines Only	1	2JH-482A	141338	Stud - Bushing Adjusting (With Auto	
	115454	Plain and Vertical Machines Without				Table Cycle and Spindle Stop)	1
		Auto Table Cycle, 2MI and 3MI		2JH-483A	664	Nut - Hex (With Auto Table Cycle and	
		Universal Machines	1			Spindle Stop)	1
2JH-440A	664	Nut - Hex	1	2JH-484A		Body - Valve	
2JH-441A		Dog - Positive Stop - R. H.			142667	With Auto Table Cycle and Spindle Stop .	1
	128160	2ML Universal Machines Only	1		141351	With Auto Table Cycle Without Spindle	
	111371	Plain and Vertical Machines Without				Stop	1
		Auto Table Cycle, 2MI and 3MI		2JH-485A		Plug - Pipe	
		Universal Machines	1		4236	With Auto Table Cycle and Spindle Stop .	15
2JH-442A	3203	Screw	2		4236	With Auto Table Cycle Without Spindle	
2JH-443A	3636	Pin	1			Stop	8
2JH-444A	3220	Bolt - Tee	2	2JH-486A	13665	Ball (With Auto Table Cycle)	1
2JH-445A	108532	Dog - L. H. (With Auto Table Cycle)	1	2JH-487A	1962	Plug (With Auto Table Cycle)	1
2JH-446A	3220	Bolt - Tee	2	2JH-488A	1917	Screw - Set (With Auto Table Cycle)	1
2JH-447A	3636	Pin (With Auto Table Cycle)	1	2JH-489A		Plug - Pipe	
2JH-448A	234042	Screw (With Auto Table Cycle)	2		76644	With Auto Table Cycle With Spindle Stop	3
2JH-449A	3220	Bolt - Tee	2		76644	With Auto Table Cycle Without Spindle	
2JH-450A	108533	Dog - R. H. (With Auto Table Cycle)	1			Stop	2
2JH-451A	3220	Bolt - Tee	2	2JH-490A	141339	Nut - Bushing Adjusting (With Auto	
2JH-452A	128110	Dog - Safety - R. H. (With Auto Table				Table Cycle and Spindle Stop)	1
		Cycle)	1	2JH-491A		Bushing - Flanged - R. T. Valve	
2JH-453A	3400	Screw (With Auto Table Cycle)	1		142558	With Auto Table Cycle and Spindle Stop .	1
2JH-454A	128109	Dog - Safety - L. H. (With Auto Table			141350	With Auto Table Cycle Without Spindle	
		Cycle)	1			Stop	1
2JH-455A	3162	Pin (With Auto Table Cycle)	2	2JH-492A	3218	Screw (With Auto Table Cycle)	4
2JH-456A	3400	Screw (With Auto Table Cycle)	1	2JH-493A	3530	Plug (With Auto Table Cycle)	1
2JH-457A	140735	Dog - Reverse Rate - L. H. (With Auto		2JH-494A	142002	Pin (With Auto Table Cycle)	2
		Table Cycle)	1	2JH-495A	3251	Screw (With Auto Table Cycle)	4
2JH-458A	664	Nut - Hex	1	2JH-496A	30803	Elbow - Street (With Auto Table Cycle	
2JH-459A	3285	Pin (With Auto Table Cycle)	1			and Spindle Stop)	1
2JH-460A	664	Nut - Hex	1	2JH-497A	141341	Hose - Flexible (With Auto Table Cycle) .	2
2JH-461A	1213	Screw - Set (With Auto Table Cycle)	2	2JH-498A	141335	Nut - Bushing Lock (With Auto Table	
2JH-462A	108533	Dog - R. H. (With Auto Table Cycle)	1			Cycle)	1
2JH-463A	236340	Spring (With Auto Table Cycle)	2	2JH-499A	141332	Bushing - R. T. Valve - Long (With	
2JH-464A	140933	Sleeve - Spring (With Auto Table Cycle)	2			Auto Cycle)	1
2JH-465A	664	Nut - Hex	2	2JH-500A	142599	Plunger - R. T. Valve (With Auto Table	
2JH-466A	140932	Dog - Stop Flipper (With Auto Table				Cycle)	1
		Cycle)	1	2JH-501A	141331	Bushing - R. T. Valve - Short (With	
2JH-467A	141036	Cover - Flipper Dog (With Auto Table				Auto Table Cycle)	1
2JH-468A	140935	Body - Inter. Stop Dog (With Auto Table		2JH-502A	141342	Hose - Flexible (With Auto Table Cycle	
		Cycle)	1			and Spindle Stop)	1
2JH-469A	664	Nut - Hex	2	2JH-503A	29810	Elbow - Street (With Auto Table Cycle) .	2
				2JH-504A	141343	Hose - Flexible (With Auto Table Cycle) .	1

SADDLE-TABLE LUBRICATION

2ML PLAIN AND 2MI PLAIN AND VERTICAL



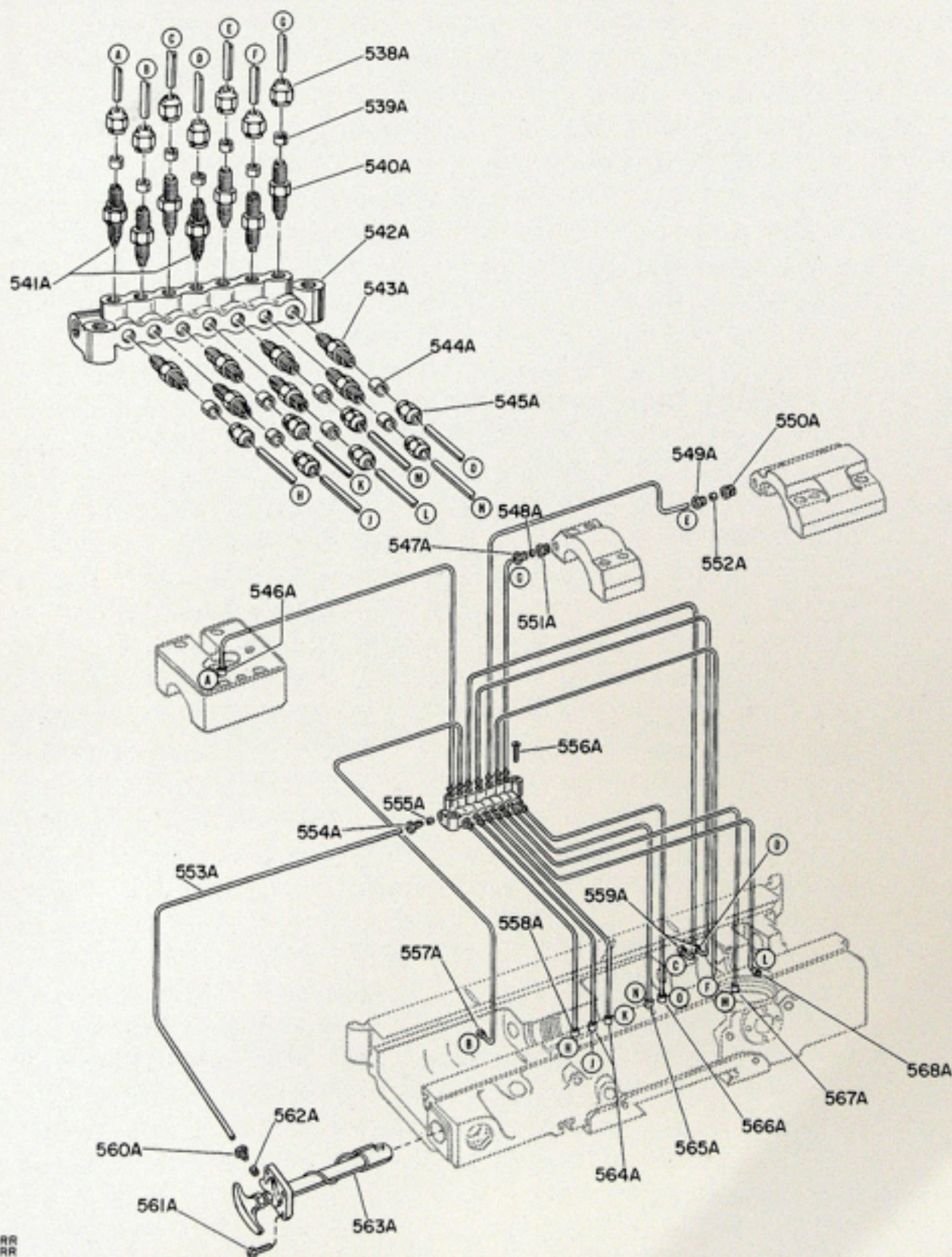
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued) 3MI PLAIN MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-538A	214294	Nut - Compression	7	2JH-554A	214300	Bush - Compression	1
2JH-539A	214304	Sleeve - Compression	7	2JH-555A	214304	Sleeve - Compression	1
2JH-540A	220004	Plug - Drip	5	2JH-556A	2256	Screw	2
2JH-541A	77196	Plug - Drip	2	2JH-557A	77197	Bush - Oil Tube	1
2JH-542A	111377	Junction	1	2JH-558A	77197	Bush - Oil Tube	1
2JH-543A	220004	Plug - Drip	7	2JH-559A	77197	Bush - Oil Tube	1
2JH-544A	214304	Sleeve - Compression	7	2JH-560A	214300	Bush - Compression	1
2JH-545A	214294	Nut - Compression	7	2JH-561A	3218	Screw	4
2JH-546A	77197	Bush - Oil Tube	1	2JH-562A	214304	Sleeve - Compression	1
2JH-547A	214300	Bush - Compression	1	2JH-563A	96257	Pump - Lubricator	1
2JH-548A	214304	Sleeve - Compression	1	2JH-564A	77197	Bush - Oil Tube	2
2JH-549A	214300	Bush - Compression	1	2JH-565A	77197	Bush - Oil Tube	1
2JH-550A	214303	Adapter - Straight	1	2JH-566A	77197	Bush - Oil Tube	1
2JH-551A	214303	Adapter - Straight	1	2JH-567A	77197	Bush - Oil Tube	1
2JH-552A	214304	Sleeve - Compression	1	2JH-568A	77197	Bush - Oil Tube	1
2JH-553A	113458	Tubing List	1				

SADDLE-TABLE LUBRICATION 3MI PLAIN



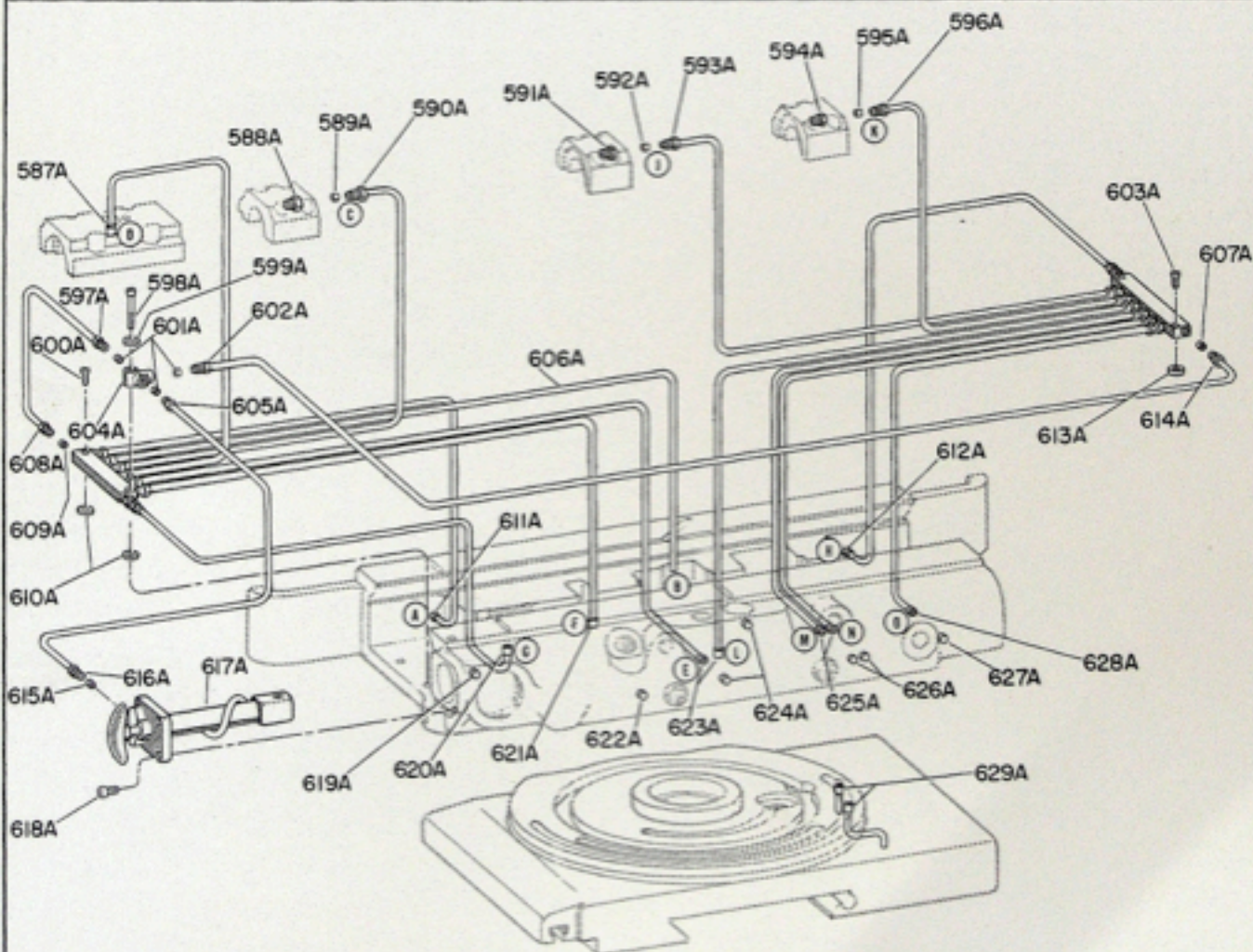
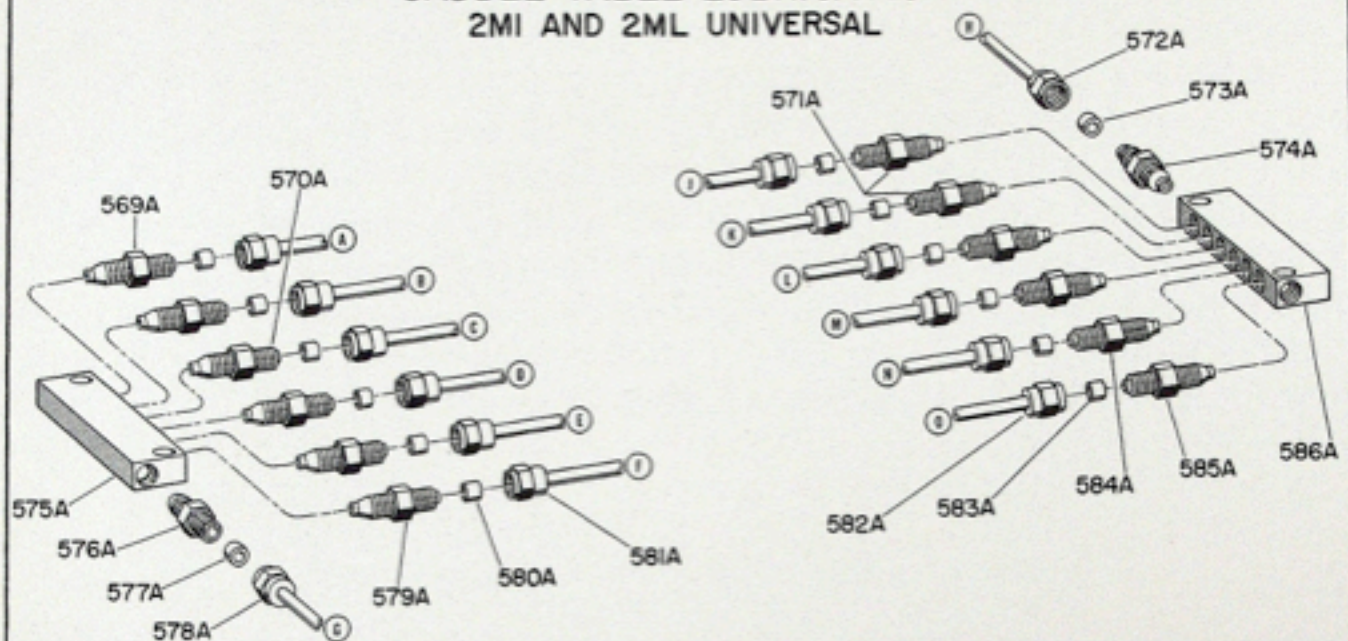
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued) 2ML PLAIN AND 2MI PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-505A	214294	Nut - Compression	7	2JH-522A	77197	Bush - Oil Tube	1
2JH-506A	214304	Sleeve - Compression	7	2JH-523A	214300	Bush - Compression	1
2JH-507A	220004	Plug - Drip	6	2JH-524A	214304	Sleeve - Compression	1
2JH-508A	77196	Plug - Drip	1	2JH-525A	111461	Tubing List	1
2JH-509A	111377	Junction	1	2JH-526A	77197	Bush - Oil Tube	1
2JH-510A	220004	Plug - Drip	5	2JH-527A	77197	Bush - Oil Tube	1
2JH-511A	214304	Sleeve - Compression	6	2JH-528A	214300	Bush - Compression	1
2JH-512A	214294	Nut - Compression	6	2JH-529A	214304	Sleeve - Compression	1
2JH-513A	214300	Bush - Compression	1	2JH-530A	3218	Screw	4
2JH-514A	214304	Sleeve - Compression	1	2JH-531A	96257	Pump - Lubricator	1
2JH-515A	77411	Plug - Closure	1	2JH-532A	77197	Bush - Oil Tube	2
2JH-516A	77196	Plug - Drip	1	2JH-533A	77197	Bush - Oil Tube	1
2JH-517A	214303	Adapter - Straight	1	2JH-534A	77197	Bush - Oil Tube	1
2JH-518A	214304	Sleeve - Compression	1	2JH-535A	77197	Bush - Oil Tube	2
2JH-519A	214300	Bush - Compression	1	2JH-536A	77197	Bush - Oil Tube	1
2JH-520A	214303	Adapter - Straight	1	2JH-537A	77197	Bush - Oil Tube	1
2JH-521A	2256	Screw	2				

SADDLE-TABLE LUBRICATION 2MI AND 2ML UNIVERSAL



174RR

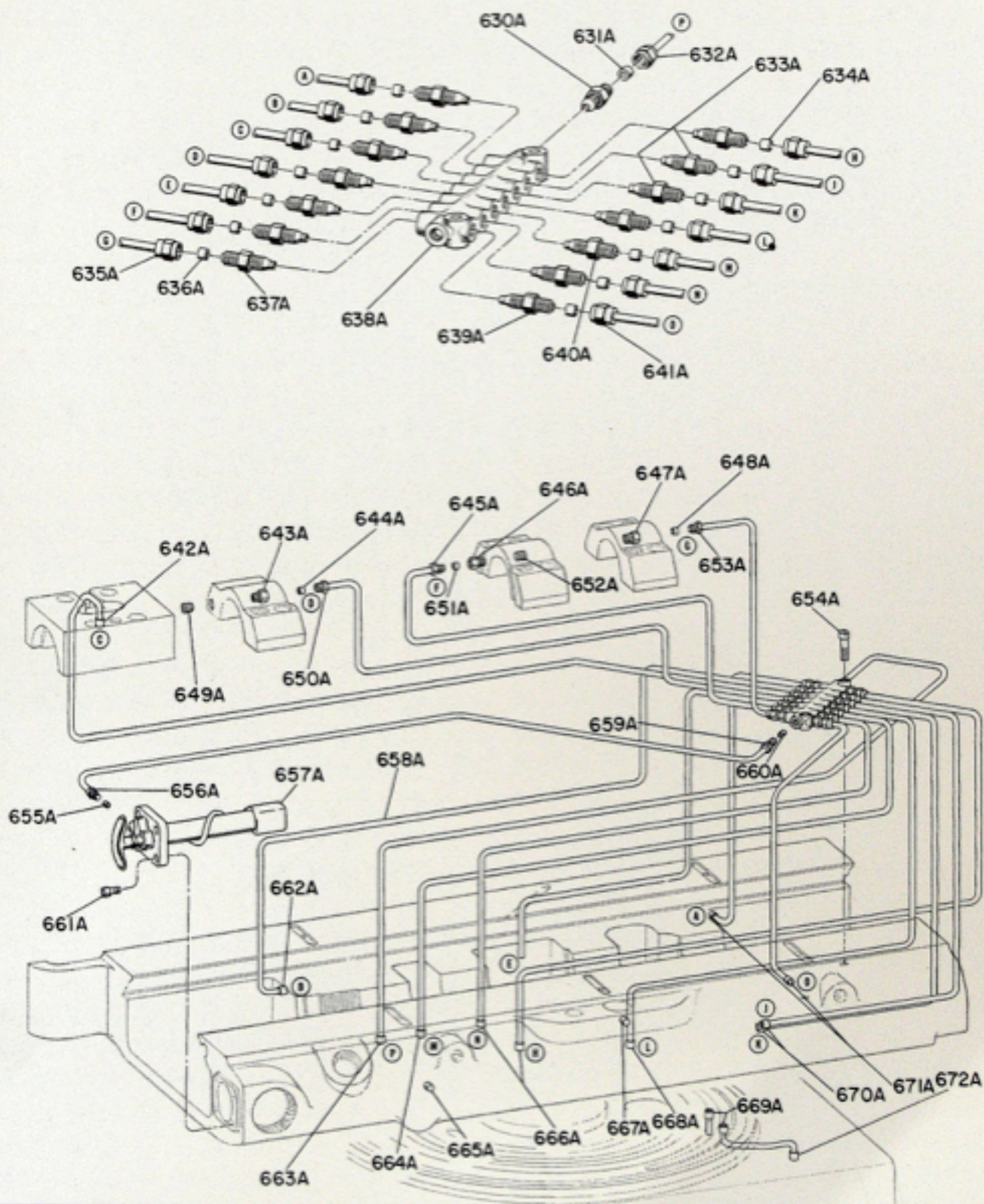
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Concluded) 3MI UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-630A	220004	Plug - Drip	1	2JH-652A	76644	Plug - Pipe	1
2JH-631A	214304	Sleeve - Compression	1	2JH-653A	214300	Bush - Compression	1
2JH-632A	214294	Nut - Compression	1	2JH-654A	3305	Screw	2
2JH-633A	77196	Plug - Drip	2	2JH-655A	214304	Sleeve - Compression	1
2JH-634A	214304	Sleeve - Compression	7	2JH-656A	214300	Bush - Compression	1
2JH-635A	214294	Nut - Compression	7	2JH-657A	96257	Pump - Lubricator	1
2JH-636A	214304	Sleeve - Compression	7	2JH-658A	112836	Tubing List	1
2JH-637A	220004	Plug - Drip	7	2JH-659A	214300	Bush - Compression	1
2JH-638A	96183	Junction	1	2JH-660A	214304	Sleeve - Compression	1
2JH-639A	220004	Plug - Drip	1	2JH-661A	3218	Screw	4
2JH-640A	77196	Plug - Drip	1	2JH-662A	77197	Bush - Oil Tube	1
2JH-641A	214294	Nut - Compression	7	2JH-663A	77197	Bush - Oil Tube	1
2JH-642A	77197	Bush - Oil Tube	1	2JH-664A	77197	Bush - Oil Tube	1
2JH-643A	214303	Adapter - Straight	1	2JH-665A	1844	Plug	1
2JH-644A	214304	Sleeve - Compression	1	2JH-666A	77197	Bush - Oil Tube	2
2JH-645A	214300	Bush - Compression	1	2JH-667A	1844	Plug	1
2JH-646A	214303	Adapter - Straight	1	2JH-668A	77197	Bush - Oil Tube	1
2JH-647A	214303	Adapter - Straight	1	2JH-669A	2237	Bush - Oil Tube	2
2JH-648A	214304	Sleeve - Compression	1	2JH-670A	77197	Bush - Oil Tube	2
2JH-649A	76644	Plug - Pipe	1	2JH-671A	77197	Bush - Oil Tube	2
2JH-650A	214300	Bush - Compression	1	2JH-672A	2237	Bush - Oil Tube	1
2JH-651A	214300	Sleeve - Compression	1				

SADDLE-TABLE LUBRICATION 3MI UNIVERSAL



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

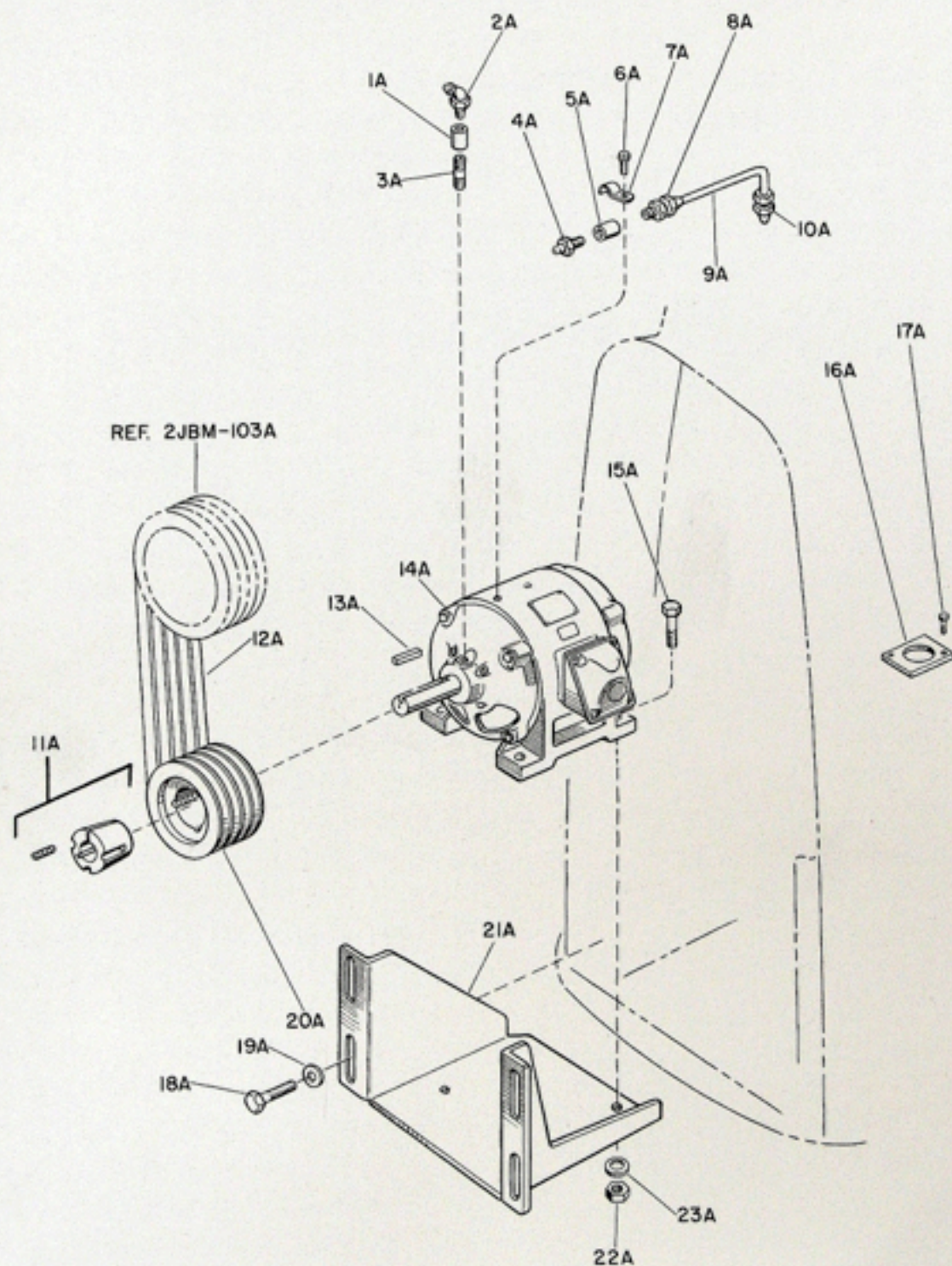
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

2MI AND 2ML UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JH-569A	220004	Plug - Drip	1	2JH-600A	3199	Screw	1
2JH-570A	220004	Plug - Drip	1	2JH-601A	214304	Sleeve - Compression	3
2JH-571A	220004	Plug - Drip	2	2JH-602A	214300	Bush - Compression	1
2JH-572A	214294	Nut - Compression	1	2JH-603A	3199	Screw	2
2JH-573A	214304	Sleeve - Compression	1	2JH-604A	214293	Junction - 3 way	1
2JH-574A	220004	Plug - Drip	1	2JH-605A	214300	Bush - Compression	1
2JH-575A	115592	Bar - Junction	1	2JH-606A	125160	Tubing List	1
2JH-576A	220004	Plug - Drip	1	2JH-607A	214304	Sleeve - Compression	1
2JH-577A	214304	Sleeve - Compression	1	2JH-608A	214300	Bush - Compression	1
2JH-578A	214294	Nut - Compression	1	2JH-609A	214304	Sleeve - Compression	1
2JH-579A	77196	Plug - Drip	4	2JH-610A	106902	Washer	2
2JH-580A	214304	Sleeve - Compression	6	2JH-611A	77197	Bush - Oil Tube	1
2JH-581A	214294	Nut - Compression	6	2JH-612A	77197	Bush - Oil Tube	1
2JH-582A	214294	Nut - Compression	6	2JH-613A	106902	Washer	2
2JH-583A	214304	Sleeve - Compression	6	2JH-614A	214300	Bush - Compression	1
2JH-584A	77196	Plug - Drip	3	2JH-615A	214304	Sleeve - Compression	1
2JH-585A	220004	Plug - Drip	1	2JH-616A	214300	Bush - Compression	1
2JH-586A	115592	Bar - Junction	1	2JH-617A	96257	Pump - Lubricator	1
2JH-587A	77197	Bush - Oil Tube	1	2JH-618A	3218	Screw	4
2JH-588A	214303	Adapter - Straight	1	2JH-619A	1844	Plug	1
2JH-589A	214304	Sleeve - Compression	1	2JH-620A	77197	Bush - Oil Tube	1
2JH-590A	214300	Bush - Compression	1	2JH-621A	77197	Bush - Oil Tube	1
2JH-591A	214303	Adapter - Straight	1	2JH-622A	1844	Plug	1
2JH-592A	214304	Sleeve - Compression	1	2JH-623A	77197	Bush - Oil Tube	2
2JH-593A	214300	Bush - Compression	1	2JH-624A	1844	Plug	2
2JH-594A	214303	Adapter - Straight	1	2JH-625A	77197	Bush - Oil Tube	2
2JH-595A	214304	Sleeve - Compression	1	2JH-626A	1844	Plug	2
2JH-596A	214300	Bush - Compression	1	2JH-627A	1844	Plug	1
2JH-597A	214300	Bush - Compression	1	2JH-628A	77197	Bush - Oil Tube	1
2JH-598A	229485	Screw	1	2JH-629A	2237	Bush - Oil Tube	2
2JH-599A	106902	Washer	1				

MOTOR DRIVE



11 RR
13 RR
167 RR
168 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

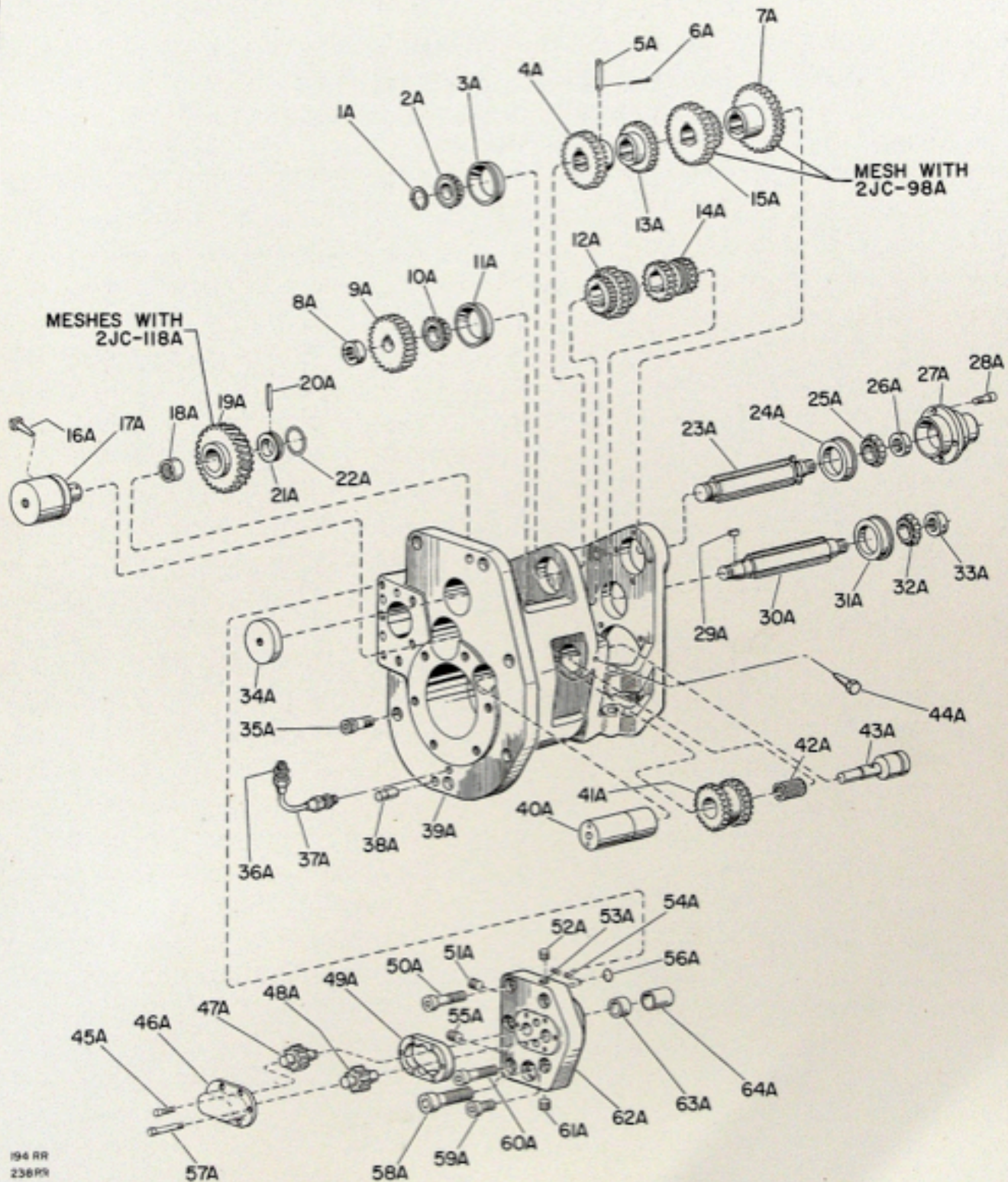
MOTOR DRIVE — UNIT No. 2JN

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JN-1A	4063	Coupling - Pipe	1	2JN-13A	Example*	Key - Motor	1
2JN-2A	3341	Fitting - Lubrication	1	2JN-14A	Example*	Motor - Drive	1
2JN-3A	36442	Nipple - Pipe	1	2JN-15A	Example*	Screw - Motor	4
2JN-4A	3342	Fitting - Lubrication	1	2JN-16A		Bracket - Conduit Support	
2JN-5A	4063	Coupling - Pipe	1		149245	2MI, 2ML Machines	1
2JN-6A	3203	Screw	1		159577	3MI Machines	1
2JN-7A	4003	Clamp - Pipe	1	2JN-17A	2209	Screw	2
2JN-8A	89866	Fitting - Tubing	1	2JN-18A		Screw	
2JN-9A		Tubing			3381	2MI, 2ML Machines	4
	137574	2MI - Open Frame Motors	1		3404	3MI Machines	4
	137576	2MI - Enclosed Frame Motors	1	2JN-19A	3442	Washer	4
	137575	2ML - Open Frame Motors	1	2JN-20A		Sheave - Motor	
	137574	2ML - Enclosed Frame Motors	1		140137	2MI Plain and Universal Machines -	
	137576	3MI - Open Frame Motors	1			1800 RPM	1
2JN-10A	89866	Fitting - Tubing	1		140139	2MI Plain and Universal Machines -	
2JN-11A		Bushing - Sheave - Taper Lock				1500 RPM	1
	140142	2MI - 1-1/8 In. Bore (Old FR. 254, New 215)	1		140140	2MI Vertical Machines - 1800 RPM	1
	140143	2MI - 1-1/4 In. Bore (Old FR. 284)	1		140141	2MI Vertical Machines - FR. 215, 254 -	
	140436	2ML - 1 In. Bore (Old FR. 225)	1			1500 RPM	1
	140142	2ML - 1-1/8 In. Bore (New FR. 213)	1		140439	2MI Vertical Machines - FR. 284 -	
	139937	3MI - 1-1/4 In. Bore (Old FR. 284)	1			1500 RPM	1
	140143	3MI - 1-1/4 In. Bore (Old FR. 326)	1		140438	2ML Machines - 1800 RPM	1
	150879	3MI - 1-3/8 In. Bore	1		140437	2ML Machines - 1500 RPM	1
	139938	3MI - 1-5/8 In. Bore (New FR. 254)	1		150878	3MI Machines - FR. 254 - 1800 RPM	1
2JN-12A		Belt - Vee			140441	3MI Machines - FR. 284 - 1800 RPM	1
	125161	2MI, Plain and Universal Machines			140440	3MI Machines - FR. 254, 284, 326 -	
		FR. 254 - 1800 RPM or FR. 284 - 1500 RPM	4	2JN-21A		1500 RPM	1
	136690	2MI, Plain and Universal Machines				Bracket - Motor Mounting	
		FR. 215 - 1800 RPM or FR. 254 - 1500 RPM	4		116137	2MI Machines	1
	150877	2MI, Plain and Universal Machines			111477	2ML Machines	1
		FR. 215 - 1500 RPM	4		128325	3MI Machines	1
	125161	2MI Vertical Machines		2JN-22A	3479	Nut - Hex	4
		FR. 254 - 1800 RPM	4	2JN-23A	3442	Washer	4
	136690	2MI Vertical Machines					
		FR. 254 - 1500 RPM or FR. 214 - 1800 RPM	4				
	150877	2MI Vertical Machines					
		FR. 215 - 1500 RPM	4				
	136689	2ML Machines					
		FR. 213 - 1800 RPM or FR. 225 - 1500 RPM	3				
	150876	2ML Machines					
		FR. 213 - 1500 RPM	3				
	249138	3MI Machines					
		FR. 254 - 1800 RPM or FR. 284 - 1500 RPM	5				
	128321	3MI Machines					
		FR. 284 - 1800 RPM or FR. 326 - 1500 RPM	5				
	150880	3MI Machines					
		FR. 254 - 1500 RPM	5				

*Give Serial Number of Machine when ordering these parts.

DRIVE BRACKET



194 RR
238 RR
239 IP

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

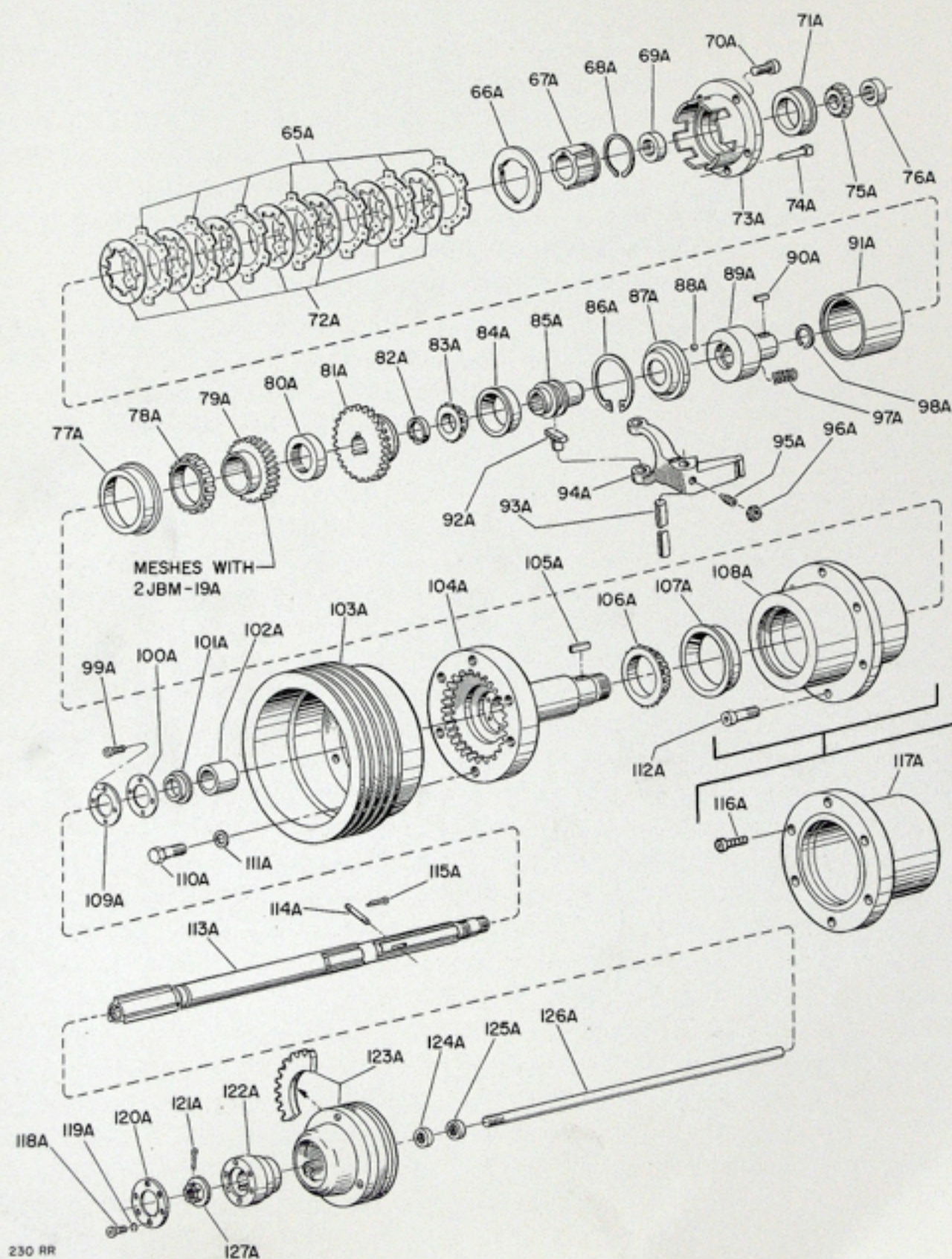
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

DRIVE BRACKET — UNIT No. 2JBM

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JBM-1A	121560	Ring - Retaining	1	2JBM-34A	3947	Plug	1
2JBM-2A	95523	Cone - Bearing	1	2JBM-35A	3317	Screw	6
2JBM-3A	95526	Cup - Bearing	1	2JBM-36A	70382	Fitting - Tubing (2MI, 3MI Machines Only)	2
2JBM-4A	123678	Gear - Primary Change - 36T	1	2JBM-37A	122767	Tubing - Drain (2MI, 3MI Machines Only)	1
2JBM-5A	62810	Pin - Straight	1	2JBM-38A	1629	Pin	2
2JBM-6A	3329	Pin - Cotter	2	2JBM-39A	149230	Bracket - Drive	1
2JBM-7A	123682	Gear - Change - 44T	1	2JBM-40A		Plug - Eccentric	
2JBM-8A	4184	Nut - Lock	1		116127	Standard Series (25-1500)	1
2JBM-9A		Gear - Driven			116128	High and Low Series (20-1200, 33-2000)	1
	111082	Standard Series (25-1500)	1	2JBM-41A		Gear - Idler	1
	111080	Low Series (20-1200)	1	2JBM-42A	111056	Bearing - Needle	1
	111081	High Series (33-2000)	1	2JBM-43A		Stud - Eccentric	
2JBM-10A	111041	Cone - Bearing	1		114066	Standard Series (25-1500)	1
2JBM-11A	111040	Cup - Bearing	1		114067	High and Low Series (20-1200, 33-2000)	1
2JBM-12A	123681	Gear - Cluster - 28T and 32T	1	2JBM-44A	104471	Pin - Taper	2
2JBM-13A	123679	Gear - Primary Change - 32T	1	2JBM-45A	3397	Screw	4
2JBM-14A	123680	Gear - Cluster - 30T and 34T	1	2JBM-46A	105312	Cover - Pump	1
2JBM-15A	123683	Gear - Cluster - 22T and 40T	1	2JBM-47A	149225	Pinion - Pump - Driver	1
2JBM-16A	14556	Pin - Taper	1	2JBM-48A	149227	Pinion - Pump - Driven	1
2JBM-17A	141585	Stud - Drive Idler Gear	1	2JBM-49A	149228	Spacer - Pump	1
2JBM-18A	120323	Bearing - Needle	1	2JBM-50A	3262	Screw	1
2JBM-19A	141586	Gear - Drive Idler	1	2JBM-51A	76645	Plug - Pipe	1
2JBM-20A	124612	Pin - Straight	1	2JBM-52A	76644	Plug - Pipe	1
2JBM-21A	141584	Collar - Drive Idler	1	2JBM-53A	3228	Screw - Set	1
2JBM-22A	74414	Spring - Locking	1	2JBM-54A	3231	Screw - Set	1
2JBM-23A	118112	Shaft - Secondary Change Gear	1	2JBM-55A	76644	Plug - Pipe	1
2JBM-24A	95526	Cup - Bearing	1	2JBM-56A	129871	Ring - "O"	3
2JBM-25A	95523	Cone - Bearing	1	2JBM-57A	103401	Screw - Body Fit	2
2JBM-26A	4184	Nut - Lock	1	2JBM-58A	1952	Screw	1
2JBM-27A	120631	Pilot - Drive Bracket	1	2JBM-59A	3400	Screw	3
2JBM-28A	3266	Screw	4	2JBM-60A	3262	Screw	1
2JBM-29A	3278	Key	1	2JBM-61A	76644	Plug - Pipe	1
2JBM-30A	111091	Shaft - Primary	1	2JBM-62A	149229	Body - Hydraulic Pump	1
2JBM-31A	95526	Cup - Bearing	1	2JBM-63A	94103	Bushing	1
2JBM-32A	95523	Cone - Bearing	1	2JBM-64A	3564	Bushing	1
2JBM-33A	4184	Nut - Lock	1				

CLUTCH



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

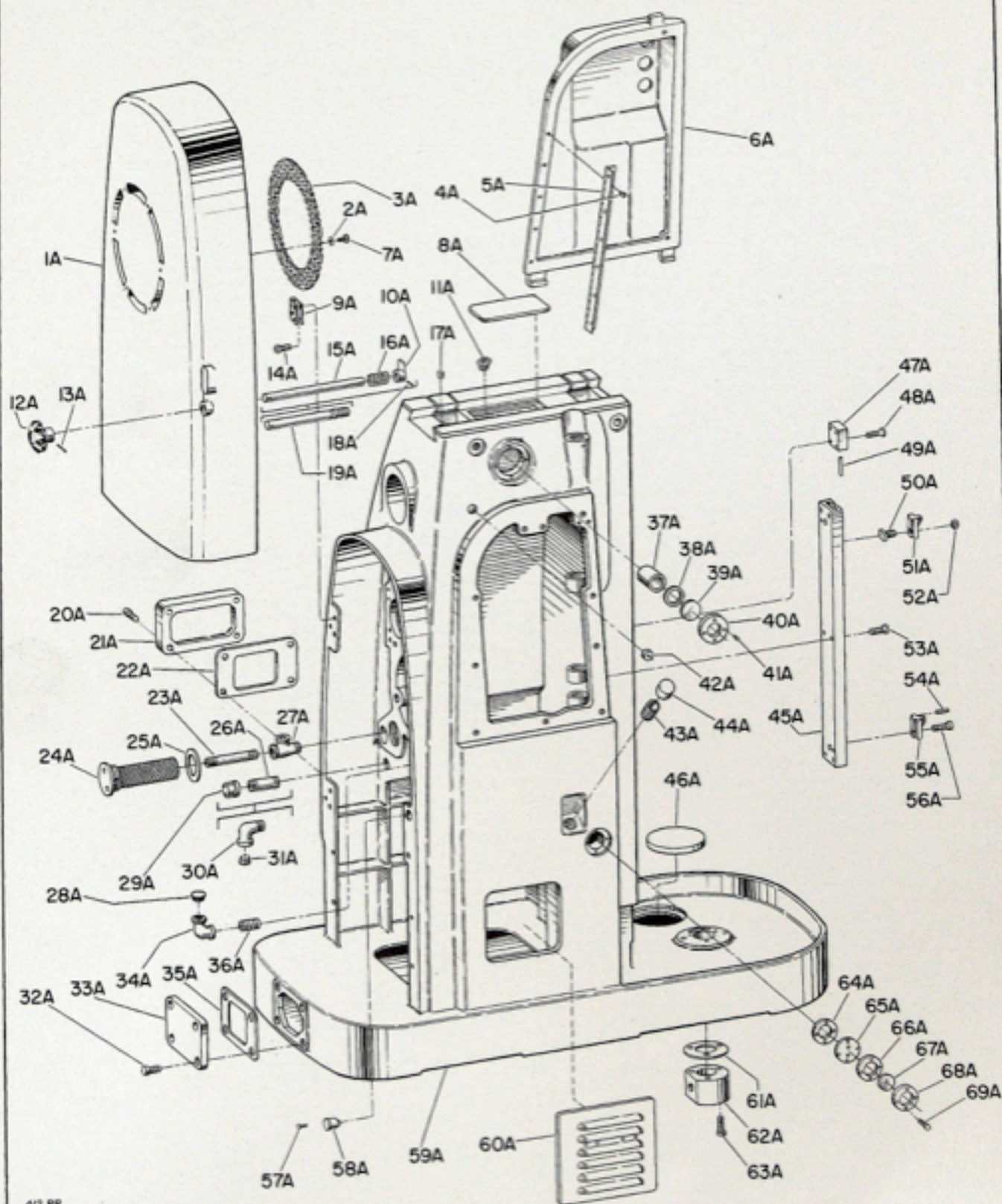
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

DRIVE BRACKET — UNIT No. 2JBM (Concluded)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JBM-65A	136863	Plate - Driving	7	2JBM-102A	124437	Bushing - Drive Shaft	1
2JBM-66A	116490	Plate - Pressure - Brake	1	2JN-103A		Sheave - Driven	1
2JBM-67A	147983	Hub - Brake Plates	1		116126	2MI Plain and Universal Machines	1
2JBM-68A	116491	Ring - Retaining	1		120640	2MI Vertical Machines (Motor Fr. 254)	1
2JBM-69A	4185	Nut - Lock	1		128476	2MI Vertical Machines (Motor Fr. 284)	1
2JBM-70A	3399	Screw	4		111108	2ML Machines	1
2JBM-71A	111078	Cup - Bearing	1		128324	3MI Machines	1
2JBM-72A	136862	Plate - Driven	7	2JBM-104A		Hub - Driven Sheave	1
2JBM-73A	116497	Housing - Brake Plates	1		124489	2MI, 3MI Machines	1
2JBM-74A	14456	Pin - Taper	4		116539	2ML Machines	1
2JBM-75A	111050	Cone - Bearing	1	2JBM-105A	345	Key - Square	1
2JBM-76A	4184	Nut - Lock	1	2JBM-106A	111066	Cone - Bearing	1
2JBM-77A	111058	Cup - Bearing	1	2JBM-107A	111058	Cup - Bearing	1
2JBM-78A	111066	Cone - Bearing	1	2JBM-108A	116125	Sleeve - Sheave Hub (2MI, 2ML Machines Only)	1
2JBM-79A	127430	Gear	1	2JBM-109A	124477	Closure - Sheave Hub	1
2JBM-80A	114064	Nut - Lock	1	2JN-110A	49	Screw	6
2JBM-81A		Gear - Spindle Drive	1	2JN-111A	2135	Washer - Lock	6
	111099	Standard Series (25-1500)	1	2JBM-112A	3400	Screw (2MI, 3MI Machines Only)	6
	111097	Low Series (20-1200)	1	2JBM-113A		Shaft - Main Drive	1
	111098	High Series (33-2000)	1		116480	2MI, 3MI Machines	1
2JBM-82A	111059	Washer - Thrust	1		116538	2ML Machines	1
2JBM-83A	111074	Cone - Bearing	1	2JBM-114A	111024	Pin - Clutch	1
2JBM-84A	111075	Cup - Bearing	1	2JBM-115A	3329	Pin - Cotter	1
2JBM-86A	116488	Ring - Retaining	1	2JBM-116A	3266	Screw (2ML Machines Only)	6
2JBM-87A	125038	Plate - Brake Ball	1	2JBM-117A	116540	Sleeve - Sheave Hub (2ML Machines Only)	1
2JBM-88A	30154	Ball - Steel	12	2JBM-118A	3199	Screw	6
2JBM-89A	116486	Body - Brake	1	2JBM-119A	205878	Washer - Lock	6
2JBM-90A	3447	Key - Square	1	2JBM-120A	116481	Cap - Clutch Cone	1
2JBM-91A	125037	Retainer - Brake Ball	1	2JBM-121A	1959	Pin - Cotter	1
2JBM-92A	111117	Shoe - Starting Lever Yoke	2	2JBM-122A	125251	Sleeve - Cone Ring	1
2JBM-93A	111116	Shaft - Starting Lever Yoke	1	2JBM-123A	111102	Clutch - Twin Disc	1
2JBM-94A	116496	Yoke - Starting Lever	1	2JBM-124A	116478	Seal - Oil	1
2JBM-95A	3234	Screw - Set	1	2JBM-125A	116478	Seal - Oil	1
2JBM-96A	3473	Nut - Hex	1	2JBM-126A		Rod - Clutch Operating	1
2JBM-97A	111072	Spring	6		116479	2MI, 3MI Machines	1
2JBM-98A	116462	Ring - Retaining	1		116541	2ML Machines	1
2JBM-99A	3203	Screw	4	2JBM-127A	116484	Nut - Clutch Cone Ring	1
2JBM-100A	124485	Gasket - Sheave Hub Closure	1				
2JBM-101A	111052	Slinger - Oil - Sheave Hub	1				

COLUMN AND COVERS



412 RR
508 RR
509 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

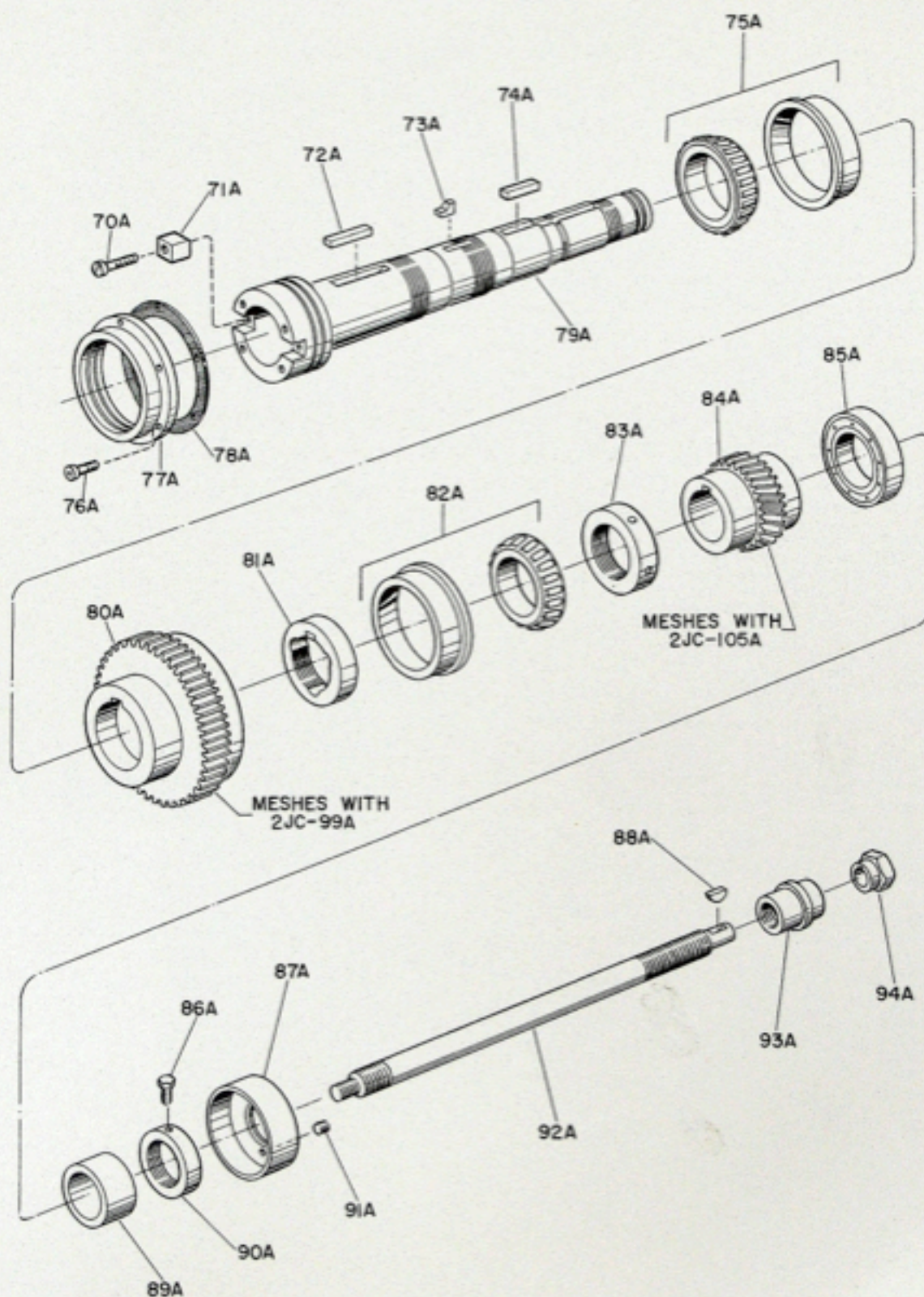
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-1A		Cover - Column - Rear		2JC-34A	12814	Elbow - Pipe	1
	149232	2MI Machines - With Latch Type Lock .	1	2JC-35A	219931	Gasket - Sump	1
	162472	2MI Machines - With Screw Type Lock .	1	2JC-36A	24815	Nipple - Pipe	1
	149231	2ML Machines - With Latch Type Lock .	1	2JC-37A		Body - Oil Gage	
	162474	2ML Machines - With Screw Type Lock .	1		108762	Plain and Universal Machines	1
	158719	3MI Machines - With Latch Type Lock .	1		63015	Vertical Machines	1
	162473	3MI Machines - With Screw Type Lock .	1	2JC-38A	3850	Gasket - Oil Gage	1
2JC-2A	106902	Washer	6	2JC-39A	3849	Disc - Oil Gage	1
2JC-3A		Screen - Cover		2JC-40A	4075	Cover - Oil Gage	1
	116416	2MI, 2ML Machines	1	2JC-41A	3213	Screw	4
	128243	3MI Machines	1	2JC-42A	3530	Plug	1
2JC-4A	3198	Screw	11	2JC-43A	3912	Nipple - Pipe	1
2JC-5A	149250	Hinge	1	2JC-44A	3986	Cap - Oil Filler	1
2JC-6A		Cover - Electrical Compartment		2JC-45A		Bar - Tee Slot	
	149251	2MI, 2ML Plain and Universal Machines	1		116402	2MI Plain and Universal Machines . . .	1
	149252	2MI Vertical Machines	1		115334	2ML Plain and Universal, 2MI Vertical	
	162749	3MI Machines	1			Machines	1
2JC-7A	2209	Screw	6		113432	JMI Machines	1
2JC-8A	125256	Cover - Column Top (Plain and Universal		2JC-46A	108728	Cover - Base (Without Coolant Pump) . .	1
		Machines Only)	1	2JC-47A	157228	Block - Knee Stop	1
2JC-9A	128759	Hinge - Rear Column Cover	2	2JC-48A	3208	Screw	4
2JC-10A	114222	Latch - Rear Column Cover	1	2JC-49A		Pin - Stop	
2JC-11A	213032	Bushing - Reducing	1		66535	2MI, 2ML Plain, 2MI Vertical Machines	1
2JC-12A		Knob - Cover			1387	3MI Machines	1
	108829	With Latch Type Lock	1	2JC-50A	3220	Bolt - Tee	2
	153411	With Screw Type Lock	1	2JC-51A	112863	Dog - Vertical Trip	2
2JC-13A	663	Pin - Taper	1	2JC-52A	664	Nut - Hex	2
2JC-14A	3218	Screw	12	2JC-53A	3397	Screw	6
2JC-15A		Stud - Latch		2JC-54A	3304	Pin - Taper	2
	149260	2MI Machines (With Latch Type Lock) .	1	2JC-55A	161920	Dog - Positive Stop	2
	111391	2ML Machines (With Latch Type Lock) .	1	2JC-56A	3400	Screw	2
	158761	3MI Machines (With Latch Type Lock) .	1	2JC-57A	1650	Screw	1
2JC-16A	3922	Spring - Latch (With Latch Type Lock) .	1	2JC-58A	106991	Switch - Interlock	1
2JC-17A	23173	Plug (Plain and Universal Machines Only)	1	2JC-59A		Column	
2JC-18A	663	Pin - Taper (With Latch Type Lock) . . .	1		149254	2MI Plain and Universal Without Auto	
2JC-19A		Stud - Lock				Table Cycle	1
	162476	2MI, 3MI Machines (With Screw Type			159057	2MI Plain and Universal With Auto	
		Lock)	1			Table Cycle	1
	162475	2ML Machines (With Screw Type Lock) .	1		149256	2MI Vertical Without Auto Table Cycle .	1
2JC-20A	3403	Screw (Without Coolant Pump)	4		159058	2MI Vertical With Auto Table Cycle . .	1
2JC-21A	100026	Cover - Coolant Sump (Without Coolant			149255	2ML Machines Without Auto Table Cycle	1
		Pump)	1		159056	2ML Machines With Auto Table Cycle .	1
2JC-22A	219931	Gasket - Sump (Without Coolant Sump) .	1		157924	3MI Machines Without Auto Table Cycle	1
2JC-23A	118118	Pipe List	1		158770	3MI Machines With Auto Table Cycle . .	1
2JC-24A	118122	Strainer	1	2JC-60A		Louver - Column	
2JC-25A	95850	Gasket	1		149246	2MI, 2ML Machines	1
2JC-26A	27418	Nipple - Pipe (Plain and Universal			128211	3MI Machines	1
		Machines Only)	1	2JC-61A	114003	Gasket - Sump	1
2JC-27A	200820	Tee - Service	1	2JC-62A	114012	Sump - Elevating Screw	1
2JC-28A	3987	Plug - Oil Filler	1	2JC-63A	3400	Screw	3
2JC-29A	200786	Cap - Pipe (Plain and Universal Machines		2JC-64A	4077	Gasket - Oil Gage	1
		Only)	1	2JC-65A	96451	Dial - Oil Gage	1
2JC-30A	24792	Elbow - Street (Vertical Machines Only) .	1	2JC-66A	4087	Gasket - Oil Gage	1
2JC-31A	221981	Plug - Pipe (Vertical Machines Only) . .	1	2JC-67A	4078	Disc - Oil Gage	1
2JC-32A	3403	Screw	4	2JC-68A	4076	Cover - Oil Gage	1
2JC-33A	100026	Cover - Coolant Sump	1	2JC-69A	3197	Screw	4

HORIZONTAL SPINDLE



239RR
265RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

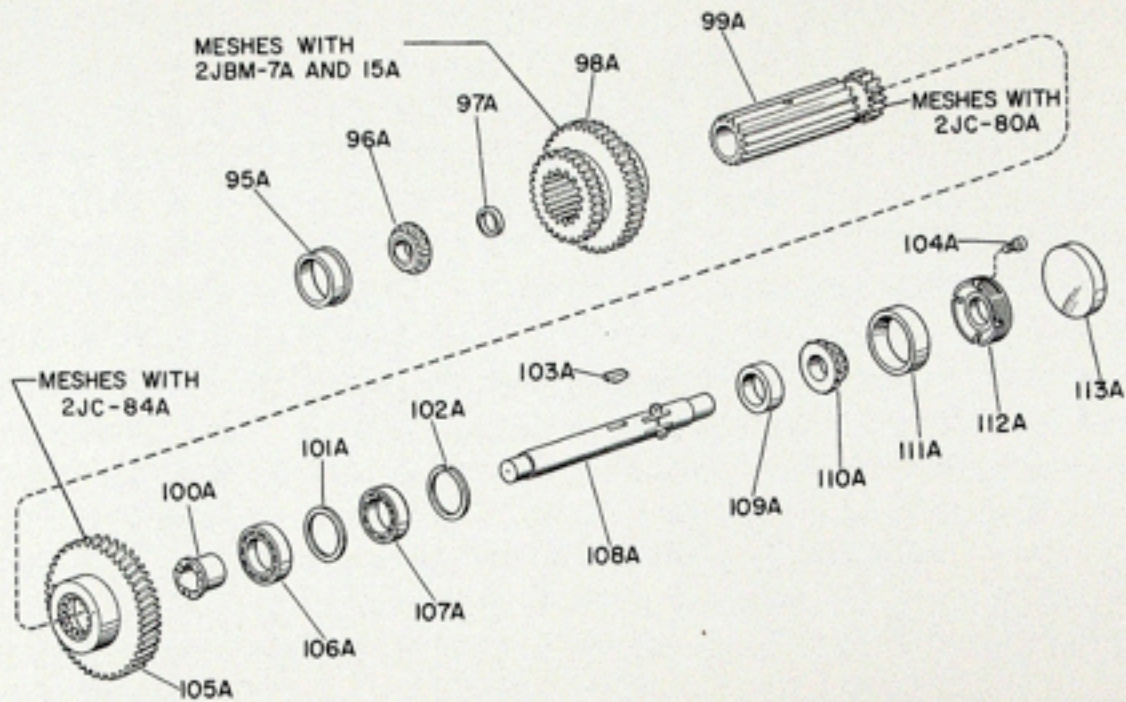
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

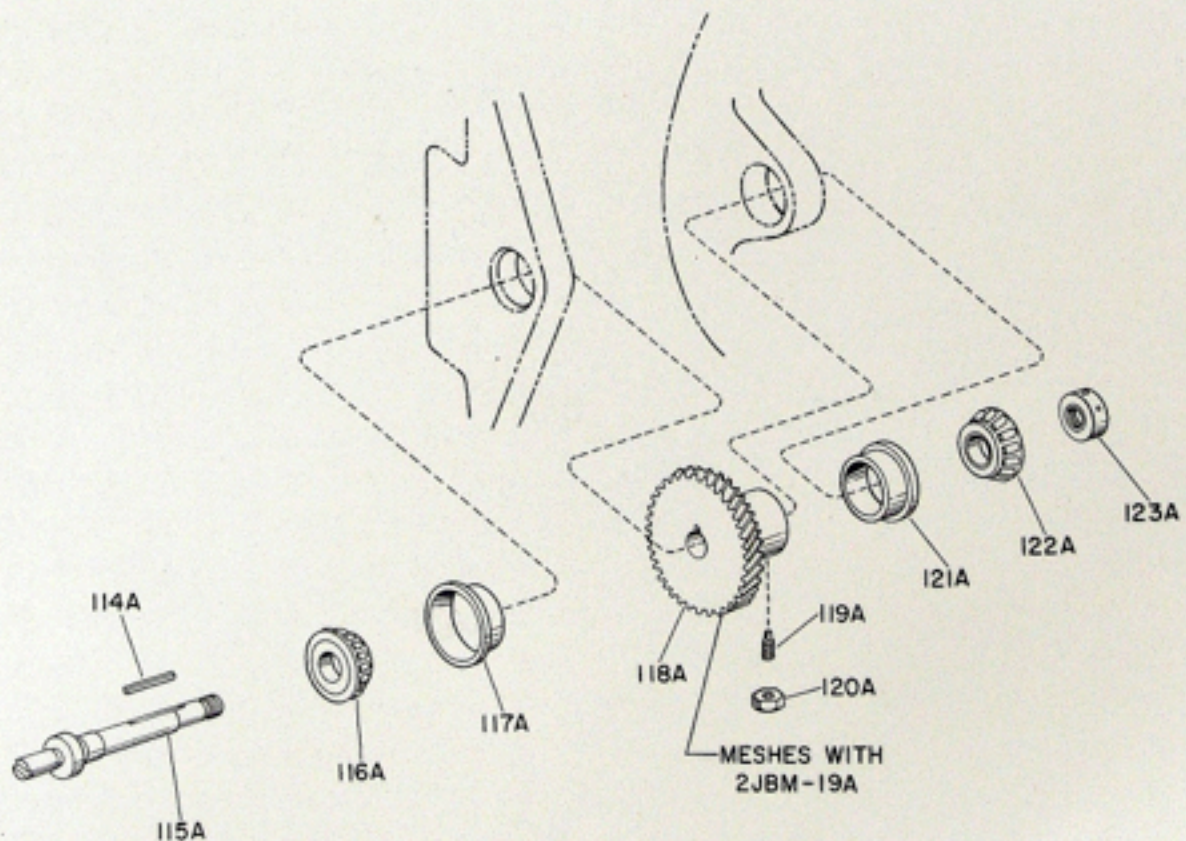
PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-70A	1158	Screw - Slotted Head	2	2JC-83A	217874	Nut - Lock	1
2JC-71A	3687	Key - Arbor Drive	2	2JC-84A	111093	Gear - Spindle	1
2JC-72A	221833	Key - Spindle	1	2JC-85A	97812	Bearing - Ball	1
2JC-73A	4004	Key - Bearing Lock	1	2JC-86A	123392	Screw - Set	1
2JC-74A	3446	Key	1	2JC-87A	108710	Cap - Spindle Bearing	1
2JC-75A	111048	Bearing - Precision	1	2JC-88A	3280	Key - Woodruff	1
2JC-76A	3396	Screw	6	2JC-89A	111047	Spacer - Spindle - Rear	1
2JC-77A	114225	Cap - Front Spindle	1	2JC-90A	225932	Nut - Lock	1
2JC-78A	114223	Gasket - Spindle Cap	1	2JC-91A	1215	Screw - Set	1
2JC-79A		Spindle		2JC-92A		Bolt - Arbor Draw	
	116411	2MI, 2ML Machines	1		111094	2MI, 2ML Machines	1
	128223	3MI Machines	1		128217	3MI Machines	1
2JC-80A	123687	Gear - Face	1	2JC-93A	3641	Nut - Arbor Draw Bolt	1
2JC-81A	116413	Nut - Lock	1	2JC-94A	108742	Head - Draw Bolt	1
2JC-82A	111046	Bearing - Precision	1				

BACK GEAR SHAFT



PUMP DRIVE SHAFT



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND UNIVERSAL MACHINES

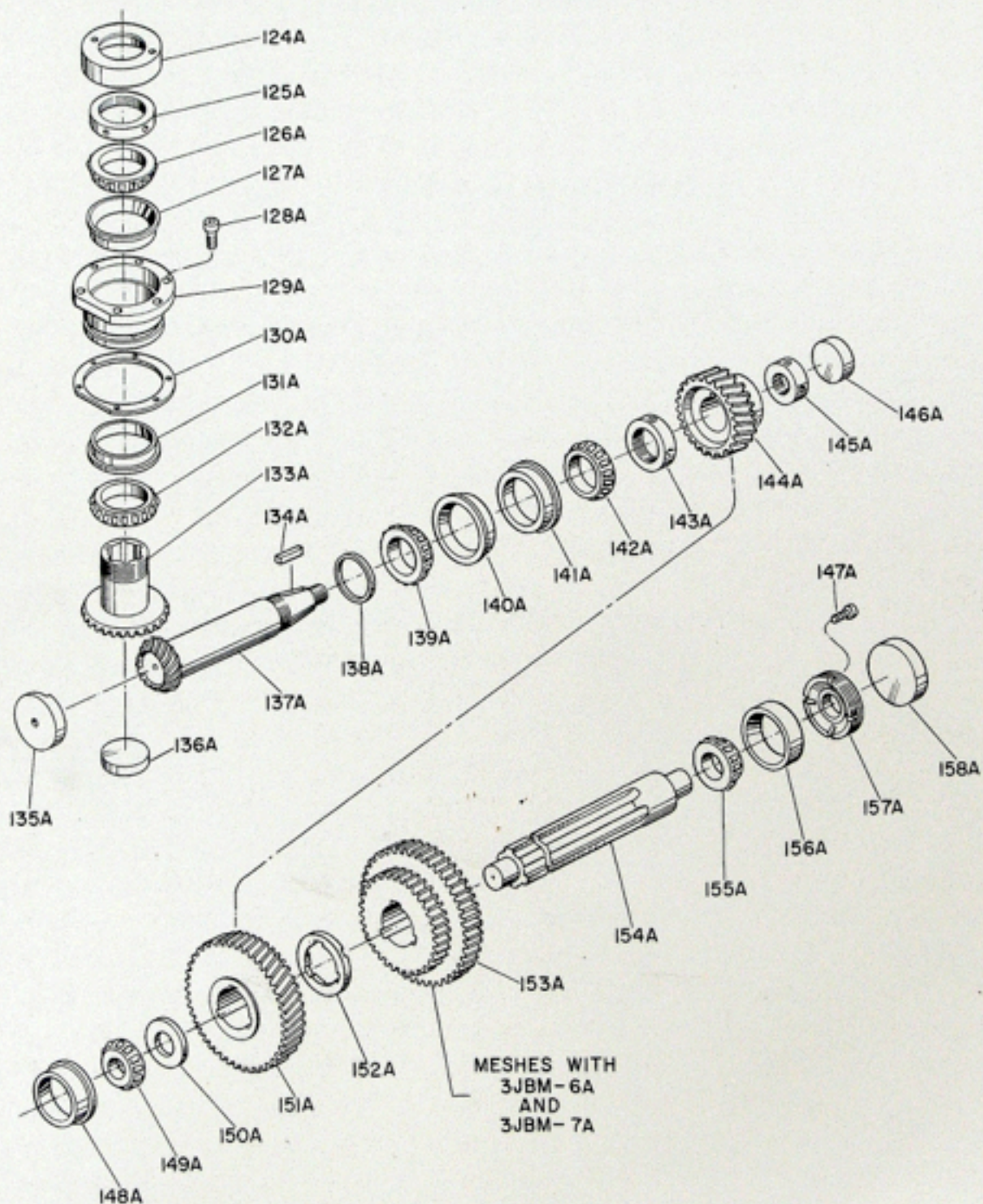
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-95A	111033	Cup - Bearing	1	2JC-105A	123684	Gear - Back	1
2JC-96A	111038	Cone - Bearing	1	2JC-106A	111035	Bearing - Ball	1
2JC-97A	111043	Washer - Thrust	1	2JC-107A	111035	Bearing - Ball	1
2JC-98A	123686	Gear - Sliding Back	1	2JC-108A	115404	Shaft - Back Gear	1
2JC-99A	143187	Gear - Back Sliding	1	2JC-109A	111036	Spacer - Back Gear	1
2JC-100A	111044	Bushing	1	2JC-110A	111038	Cone - Bearing	1
2JC-101A	111034	Ring - Retaining	1	2JC-111A	114203	Cup - Bearing	1
2JC-102A	111032	Ring - Snap	1	2JC-112A	111045	Nut - Lock	1
2JC-103A	3497	Key	1	2JC-113A	93642	Plug	1
2JC-104A	3218	Screw - Set	1				

COLUMN — UNIT No. 2JC (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-114A	963	Key	1	2JC-119A	3233	Screw - Set	1
2JC-115A	157325	Shaft - Pump Drive	1	2JC-120A	3473	Nut - Hex	1
2JC-116A	62903	Cone - Bearing	1	2JC-121A	108004	Cup - Bearing	1
2JC-117A	98776	Cup - Bearing	1	2JC-122A	94234	Cone - Bearing	1
2JC-118A	149224	Gear - Pump Drive	1	2JC-123A	4242	Nut - Lock	1

VERTICAL DRIVE SHAFTS



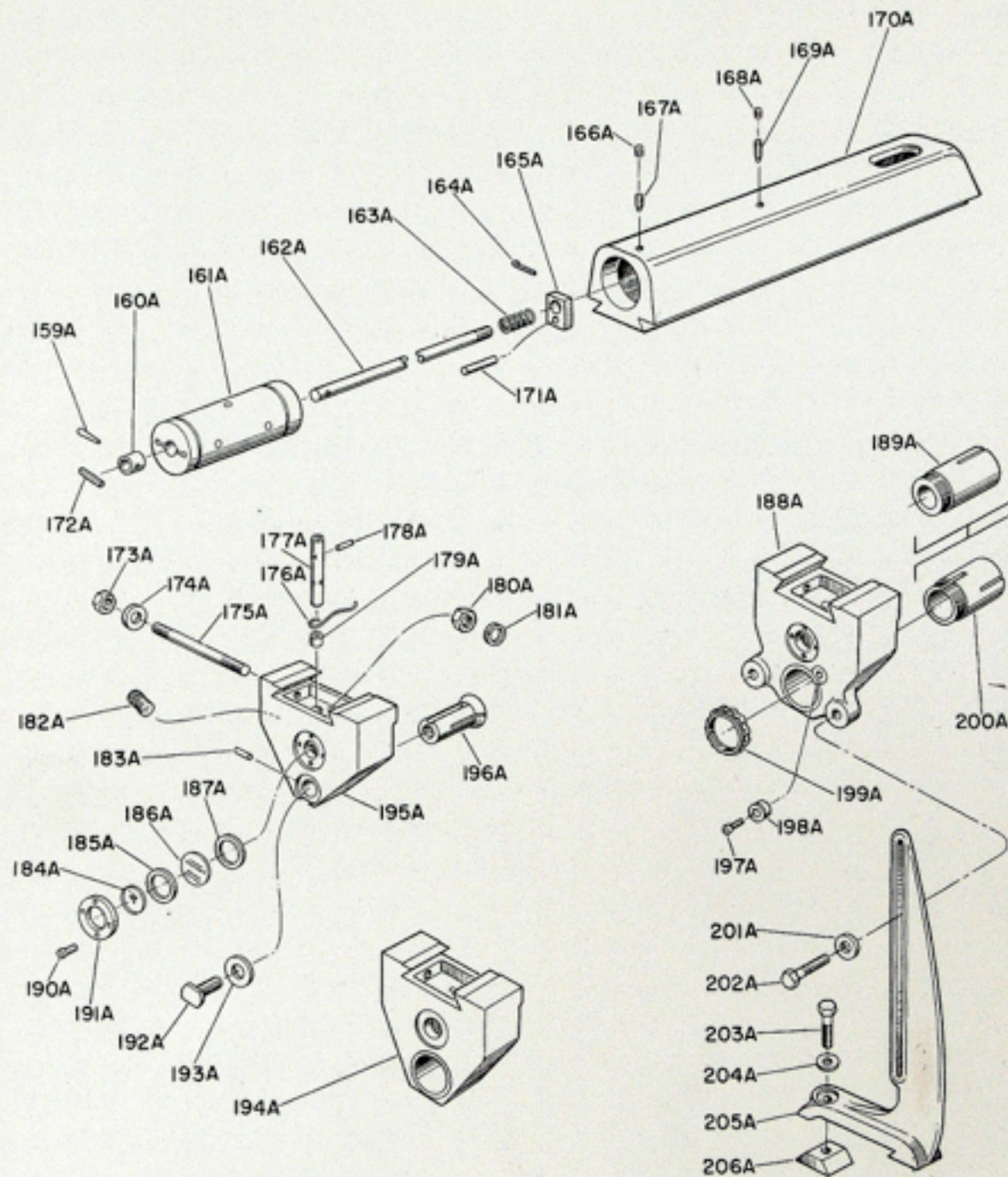
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued) 2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-124A	115356	Plug - Oil	1	2JC-142A	115303	Cone - Bearing	1
2JC-125A	110520	Nut - Lock	1	2JC-143A	119785	Nut - Lock	1
2JC-126A	115301	Cone - Bearing	1	2JC-144A	120669	Gear - Driven	1
2JC-127A	115302	Cup - Bearing	1	2JC-145A	119874	Nut - Adjusting	1
2JC-128A	3266	Screw	6	2JC-146A	3555	Plug	1
2JC-129A	115355	Retainer - Bearing	1	2JC-147A	3216	Screw	1
2JC-130A	115371	Washer - Fitting	1	2JC-148A	111033	Cup - Bearing	1
2JC-131A	115302	Cup - Bearing	1	2JC-149A	111038	Cone - Bearing	1
2JC-132A	115301	Cone - Bearing	1	2JC-150A	120671	Washer - Spacing	1
2JC-133A	115351	Gear - Spiral Bevel	1	2JC-151A	120670	Gear - Driver	1
2JC-134A	3448	Key	1	2JC-152A	108587	Washer	1
2JC-135A	115372	Plug - Front	1	2JC-153A	120673	Gear - Sliding Back	1
2JC-136A	3557	Plug	1	2JC-154A	120672	Shaft	1
2JC-137A	120647	Pinion - Spiral Bevel Stem	1	2JC-155A	111038	Cone - Bearing	1
2JC-138A	115387	Washer - Fitting	1	2JC-156A	114203	Cup - Bearing	1
2JC-139A	115303	Cone - Bearing	1	2JC-157A	111045	Nut - Adjusting	1
2JC-140A	115304	Cup - Bearing	1	2JC-158A	93642	Plug	1
2JC-141A	115304	Cup - Bearing	1				

OVERARM AND ARBOR SUPPORTS



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

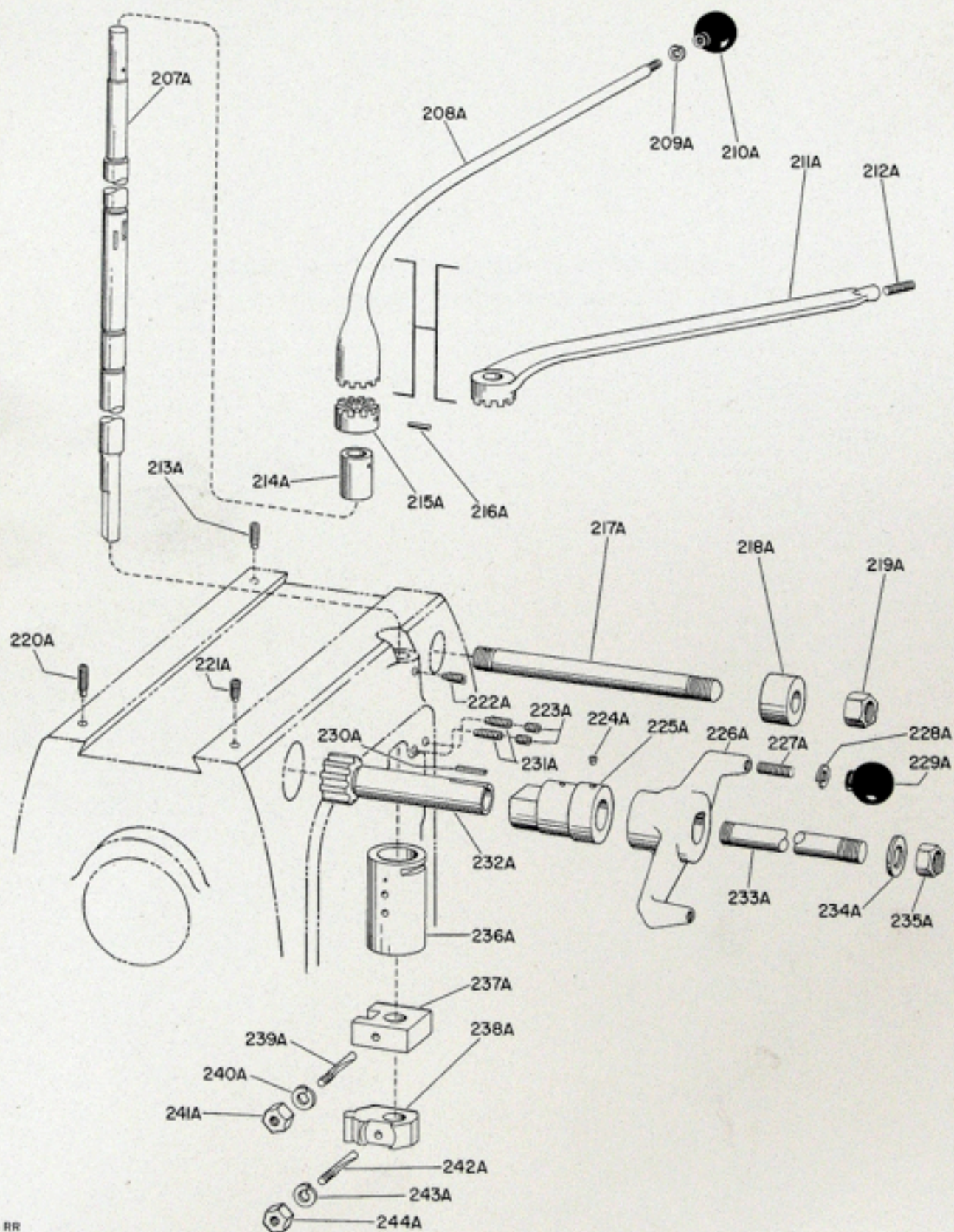
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-159A	140	Pin - Taper	1	2JC-180A	666	Nut - Hex	1
2JC-160A	128297	Collar - Rod	1	2JC-181A	2265	Washer	1
2JC-161A		Dampener - Vibration	1	2JC-182A	67608	Filler - Oil	1
	152273	2MI, 2ML Machines	1	2JC-183A	3543	Pin - Straight	1
	152257	3MI Machines	1	2JC-184A	3849	Disc - Oil Gage	1
2JC-162A		Rod - Dampener Adjusting	1	2JC-185A	4086	Gasket - Oil Gage	1
	138383	2MI, 2ML Machines	1	2JC-186A	3851	Dial - Oil Gage	1
	138382	3MI Machines	1	2JC-187A	3850	Gasket - Oil Gage	1
2JC-163A	116970	Spring - Compression	1	2JC-188A		Support - Arbor - Type "B" With Lugs	1
2JC-164A	703	Pin - Cotter	1		118276	2MI, 2ML Machines	1
2JC-165A	131862	Nut - Tension	1		128263	3MI Machines	1
2JC-166A		Screw	1	2JC-189A	3704	Adapter - Arbor Support Bushing	1
	2301	2MI, 2ML Machines	1	2JC-190A	3213	Screw	4
	1911	3MI Machines	1	2JC-191A	4075	Cover - Gage	1
2JC-167A		Screw	1	2JC-192A	3692	Screw (Type "A" Support)	1
	3232	2MI, 2ML Machines	1	2JC-193A	128	Washer - Plain (Type "A" Support)	1
	3233	3MI Machines	1	2JC-194A		Support - Arbor (Type "B" Without Lugs)	1
2JC-168A		Screw	1		122763	2MI, 2ML Machines	1
	2301	2MI, 2ML Machines	1		128264	3MI Machines	1
	1911	3MI Machines	1	2JC-195A		Support - Arbor - Type "A"	1
2JC-169A		Screw	1		118275	2MI, 2ML Machines	1
	3233	2MI, 2ML Machines	1		128265	3MI Machines	1
	3236	3MI Machines	1	2JC-196A	3695	Bushing (Type "A" Support)	1
2JC-170A		Overarm	1	2JC-197A	3484	Screw (Type "B" Support)	1
	152274	2MI, 2ML Machines	1	2JC-198A	3974	Roller (Type "B" Support)	1
	152264	3MI Machines	1	2JC-199A	3972	Nut - Arbor Adjusting (Type "B" Support)	1
2JC-171A	3863	Pin - Straight	1	2JC-200A	3697	Bushing - Arbor Support (Type "B" Support)	1
2JC-172A	128589	Pin - Square	1			Support	1
2JC-173A	3481	Nut - Hex	1	2JC-201A	1046	Washer - Plain (Type "B" Support With Lugs)	1
2JC-174A	764	Washer	1			Lugs)	1
2JC-175A		Stud	1	2JC-202A	279	Screw (Type "B" Support With Lugs)	1
	128091	2MI, 2ML Machines	1	2JC-203A	610	Screw	1
	71143	3MI Machines	1	2JC-204A	1040	Washer - Plain	1
2JC-176A	61417	Wick	1	2JC-205A		Brace - Overarm	1
2JC-177A	66344	Tube	1		147286	2MI, 2ML Machines	1
2JC-178A	3539	Pin - Straight	1		147290	3MI Machines	1
2JC-179A	63581	Plug	1	2JC-206A	111213	Clamp - Overarm Brace	1

CONTROL LEVERS



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

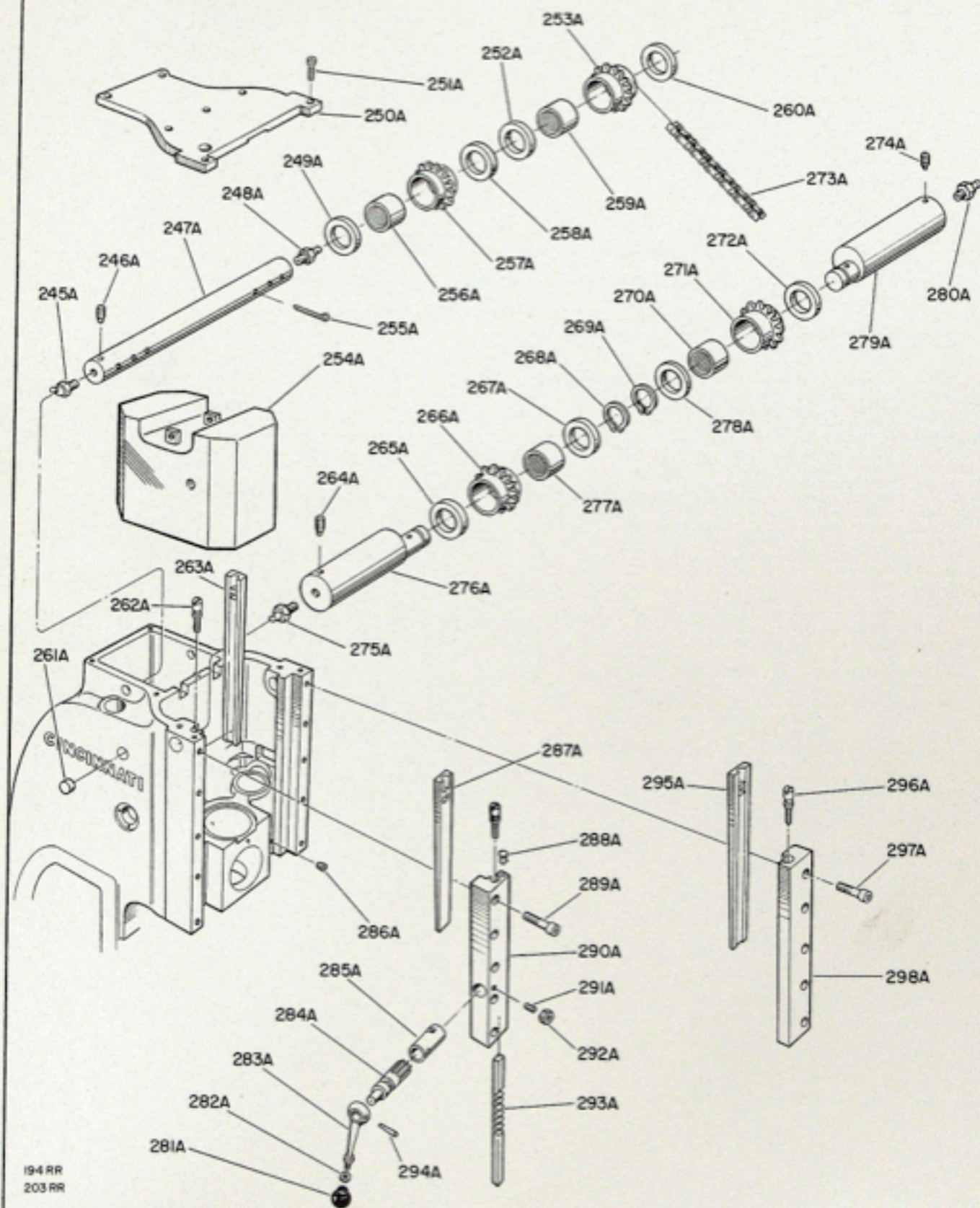
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-207A		Shaft - Starting Lever		2JC-225A	130391	Hub - Pilot Wheel (Plain and Universal Machines Only)	1
	159055	Plain and Universal Machines	1		3860	Stud (Plain and Universal Machines Only)	2
	159054	Vertical Machines	1	2JC-227A	2135	Washer - Lock (Plain and Universal Machines Only)	2
2JC-208A	157124	Lever - Starting (Plain and Universal Machines Only)	1	2JC-229A	115032	Ball - Handle (Plain and Universal Machines Only)	2
2JC-209A	2135	Washer - Lock	1		345	Key (Plain and Universal Machines Only)	1
2JC-210A	115032	Ball - Handle	1	2JC-231A	3235	Screw - Set	2
2JC-211A	113463	Lever - Starting (Vertical Machines Only)	1	2JC-232A		Piston - Pilot Wheel	
2JC-212A	3860	Stud	1		130392	2MI, 2ML Plain and Universal Machines	1
2JC-213A	3234	Screw - Set (Plain and Universal Machines Only)	1		134180	3MI Machines	1
2JC-214A	111218	Bushing - Starting Lever	1	2JC-233A		Stud - Clamp	
2JC-215A	103957	Clutch - Starting Lever	1		130393	2MI, 2ML Plain and Universal Machines	1
2JC-216A	642	Pin - Taper	1		134181	3MI Machines	1
2JC-217A		Stud - Overarm Clamp		2JC-234A	764	Washer (Plain and Universal Machines Only)	1
	115447	2MI, 2ML Plain and Universal Machines	1	2JC-235A	3481	Nut - Hex (Plain and Universal Machines Only)	1
	128241	3MI Machines	1	2JC-236A	155206	Sleeve and Bushing - Starting Lever	
2JC-218A	115436	Washer (Plain and Universal Machines Only)	1		155207	(Matched Set)	
2JC-219A	3481	Nut - Hex (Plain and Universal Machines Only)	1	2JC-237A	111118	Toggle - Starting Lever	1
2JC-220A	3235	Screw - Set (Plain and Universal Machines Only)	1	2JC-238A	138255	Toggle - Spindle Stop (With Spindle Stop)	1
2JC-221A		Screw - Set		2JC-239A	33941	Pin - Locking	1
	3232	2MI, 2ML Plain and Universal Machines	1	2JC-240A	2135	Washer - Lock	1
	3233	3MI Machines	1	2JC-241A	3473	Nut - Hex	1
2JC-222A	3233	Screw - Set	1	2JC-242A	33941	Pin - Locking (With Spindle Stop)	1
2JC-223A	1917	Screw - Set	2	2JC-243A	2135	Washer - Lock (With Spindle Stop)	1
2JC-224A	69583	Oilier (Plain and Universal Machines Only)	1	2JC-244A	3473	Nut - Hex (With Spindle Stop)	1
2JC-225A		Sleeve - Pilot Wheel					
	121525	2MI, 2ML Plain and Universal Machines	1				
	128218	3MI Machines	1				

VERTICAL HEAD COUNTERWEIGHT AND GUIDES



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

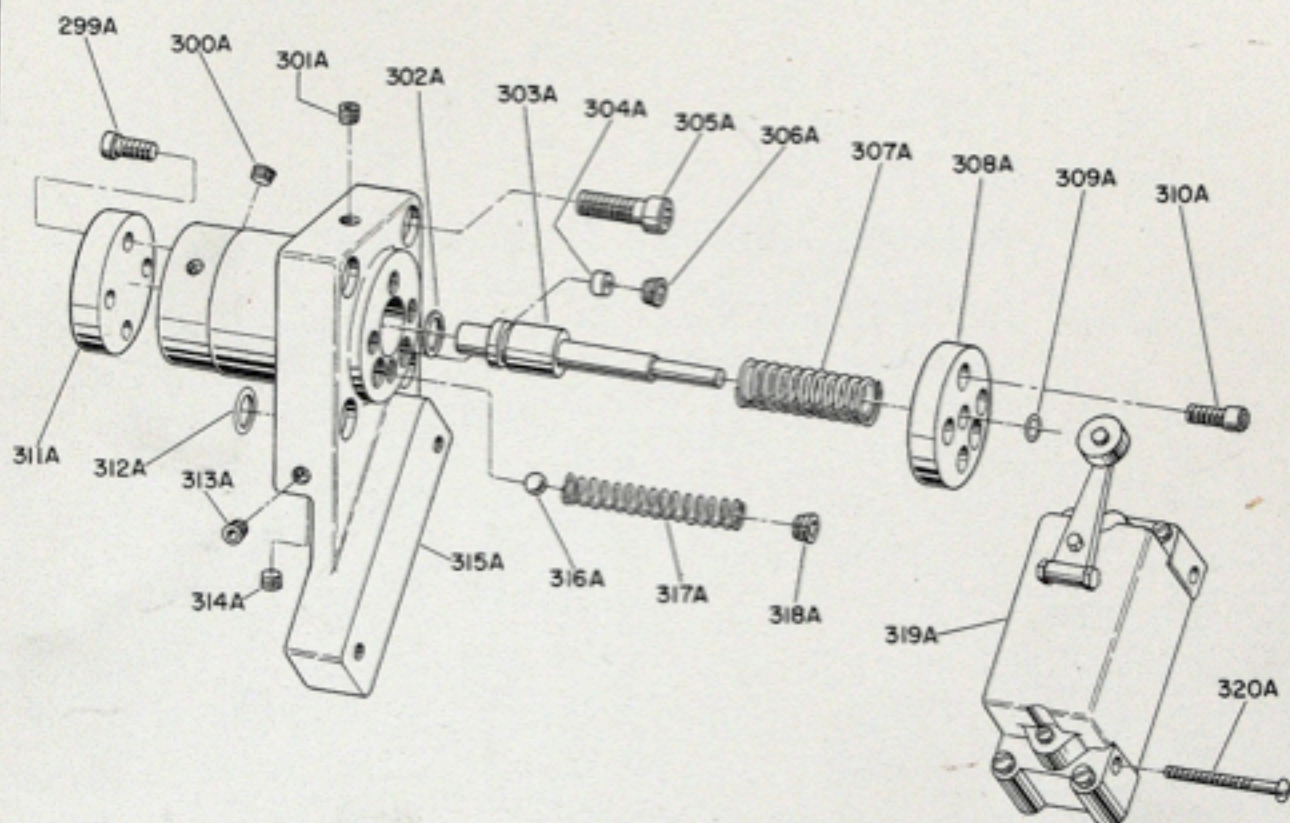
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

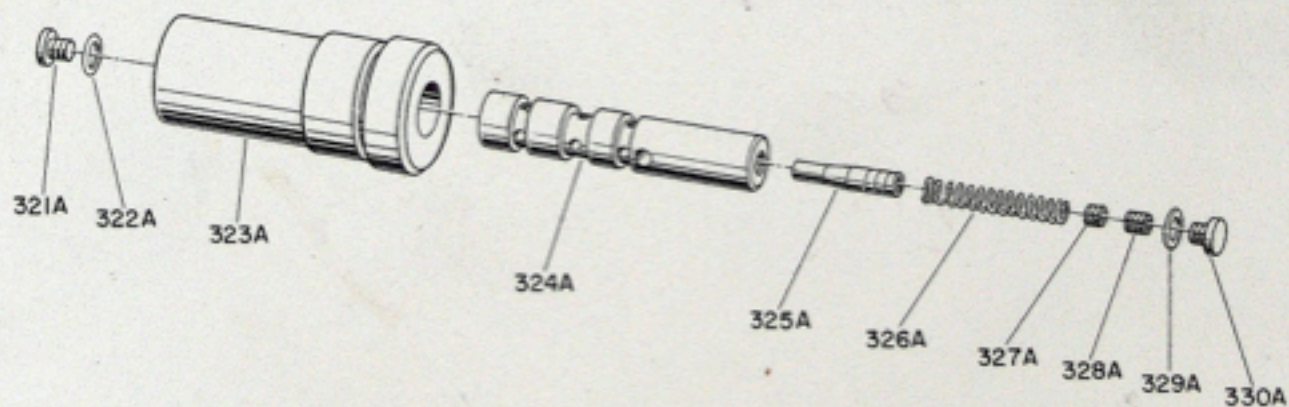
2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-245A	3341	Fitting - Lubrication	1	2JC-272A	1041	Washer - Plain	1
2JC-246A	3232	Screw - Set	1	2JC-273A	120628	Chain	2
2JC-247A	149241	Shaft - Counter-Weight Sprocket	1	2JC-274A	3232	Screw - Set	1
2JC-248A	3342	Fitting - Lubrication	1	2JC-275A	3342	Fitting - Lubrication	1
2JC-249A	1041	Washer - Plain	1	2JC-276A	120634	Shaft - Sprocket - Eccentric	1
2JC-250A	120646	Cover - Top of Column	1	2JC-277A	79762	Bearing - Needle	1
2JC-251A	3266	Screw	7	2JC-278A	1041	Washer - Plain	1
2JC-252A	1041	Washer - Plain	1	2JC-279A	120634	Shaft - Sprocket - Eccentric	1
2JC-253A	115374	Sprocket - Chain	1	2JC-280A	3342	Fitting - Lubrication	1
2JC-254A	120646	Weight - Counter	1	2JC-281A	115012	Ball - Needle	1
2JC-255A	1333	Pin - Cotter	2	2JC-282A	2120	Washer - Lock	1
2JC-256A	79762	Bearing - Needle	1	2JC-283A	103232	Lever - Control	1
2JC-257A	115374	Sprocket - Chain	1	2JC-284A	120629	Pinion - Vertical Head Clamp	1
2JC-258A	1041	Washer - Plain	1	2JC-285A	120630	Bushing - Clamp Pinion	1
2JC-259A	79762	Bearing - Needle	1	2JC-286A	76645	Plug	1
2JC-260A	1041	Washer - Plain	1	2JC-287A	127578	Gib - Vertical Head	1
2JC-261A	3551	Plug	1	2JC-288A	44980	Oilier	1
2JC-262A	63606	Screw - Gib	1	2JC-289A	1825	Screw	5
2JC-263A	115380	Gib - Vertical Head - Left Front	1	2JC-290A	120644	Guide - Vertical Head - Left	1
2JC-264A	3232	Screw - Set	1	2JC-291A	3232	Screw - Set	1
2JC-265A	1041	Washer - Plain	1	2JC-292A	2473	Nut - Lock	1
2JC-266A	115374	Sprocket - Chain	1	2JC-293A	115379	Wedge - Vertical Head Lock	1
2JC-267A	1041	Washer - Plain	1	2JC-294A	642	Pin - Taper	1
2JC-268A	237434	Ring - Retainer	1	2JC-295A	120627	Gib - Vertical Head	1
2JC-269A	237434	Ring - Retainer	1	2JC-296A	63606	Screw - Gib	1
2JC-270A	79762	Bearing - Needle	1	2JC-297A	1825	Screw	5
2JC-271A	115374	Sprocket - Chain	1	2JC-298A	120645	Guide - Vertical Head - Right	1

FEED CONTROL VALVE



RELIEF VALVE



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

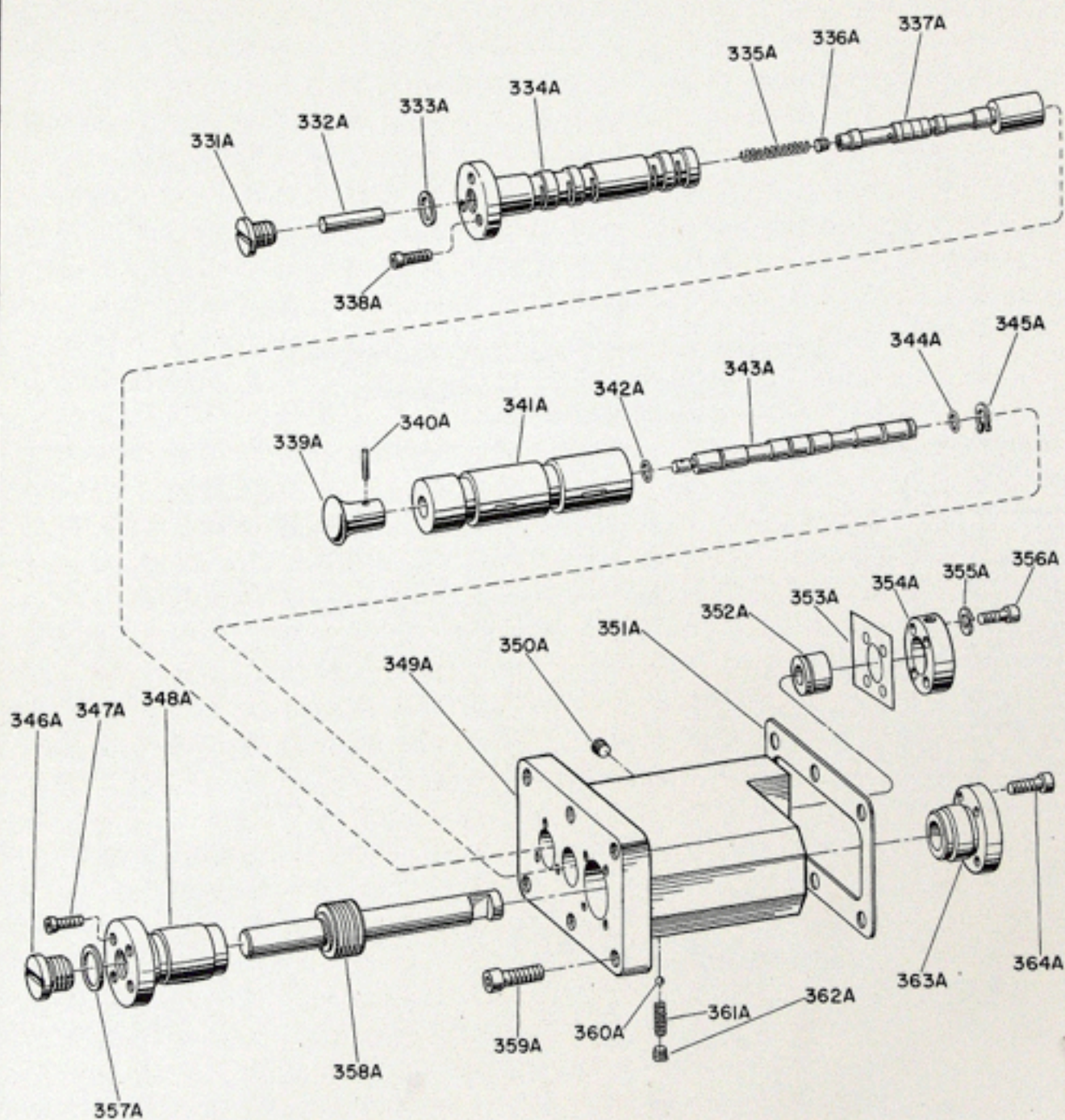
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-299A	3218	Screw	4	2JC-315A	152066	Valve - Feed Control	1
2JC-300A	4236	Plug - Pipe	2	2JC-316A	98596	Ball - Steel	1
2JC-301A	4236	Plug - Pipe	3	2JC-317A	239891	Spring	1
2JC-302A	247090	Ring - "O"	1	2JC-318A	76644	Plug - Pipe	1
2JC-303A	152062	Plunger - Feed Control Valve	1	2JC-319A	235978	Switch - Limit	1
2JC-304A	139504	Plug - Resistance	1	2JC-320A	246021	Screw	2
2JC-305A	3266	Screw	4	2JC-321A	42325	Plug - Screw	1
2JC-306A	76644	Plug - Pipe	1	2JC-322A	214359	Gasket	1
2JC-307A	152065	Spring - Compression	1	2JC-323A	149253	Body - Relief Valve	1
2JC-308A	152063	Cover - Body - Front	1	2JC-324A	151624	Bushing - Relief Valve	1
2JC-309A	130145	Ring - "O"	1	2JC-325A	151625	Valve - Relief	1
2JC-310A	3218	Screw	4	2JC-326A	98734	Spring	1
2JC-311A	152064	Cover - Body - Rear	1	2JC-327A	2356	Screw - Set	1
2JC-312A	247090	Ring - "O"	1	2JC-328A	2301	Screw - Set	1
2JC-313A	4236	Plug - Pipe	1	2JC-329A	214359	Gasket	1
2JC-314A	4236	Plug - Pipe	2	2JC-330A	42325	Plug - Screw	1

SPINDLE STOP VALVE



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

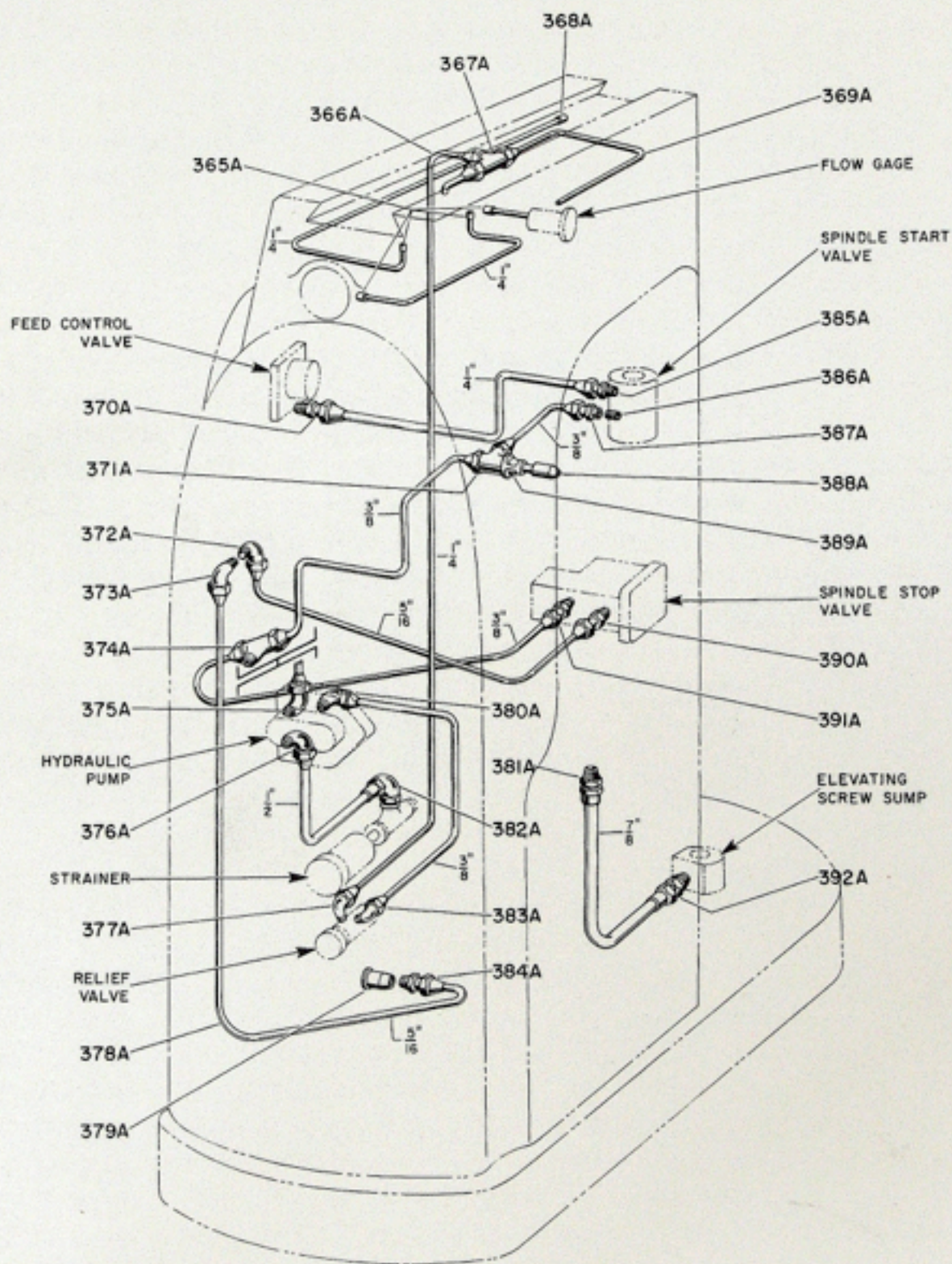
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND VERTICAL MACHINES WITH AUTO TABLE CYCLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-331A	162512	Plug - Spring Retainer	1	2JC-348A	141183	Bushing - Front - Spindle Stop Valve . . .	1
2JC-332A	3277	Pin	1	2JC-349A	165991	Body - Spindle Stop Valve	1
2JC-333A	222490	Gasket	1	2JC-350A	76644	Plug - Pipe	2
2JC-334A	161356	Bushing - Pilot Valve	1	2JC-351A	141184	Gasket - Spindle Stop Valve Body	1
2JC-335A	102524	Spring	1	2JC-352A	165989	Cartridge - Spindle Stop Valve	1
2JC-336A	4236	Plug - Pipe	1	2JC-353A	165993	Gasket - Spindle Stop Valve	1
2JC-337A	165990	Plunger - Pilot Valve	1	2JC-354A	165988	Cap - Valve	1
2JC-338A	3396	Screw	3	2JC-355A	2135	Washer - Lock	4
2JC-339A	141182	Knob	1	2JC-356A	3396	Screw	4
2JC-340A	140	Pin - Taper	1	2JC-357A	79111	Gasket	1
2JC-341A	141347	Bushing - Control Valve	1	2JC-358A	141348	Piston - Spindle Stop Valve	1
2JC-342A	243780	Ring - "O"	1	2JC-359A	2321	Screw	6
2JC-343A	141346	Plunger - Control Valve	1	2JC-360A	2290	Ball - Steel	1
2JC-344A	243780	Ring - "O"	1	2JC-361A	237417	Spring	1
2JC-345A	236956	Ring - Retainer	1	2JC-362A	4236	Plug - Pipe	1
2JC-346A	138251	Plug - Screw	1	2JC-363A	141349	Bushing - Rear - Spindle Stop Valve . . .	1
2JC-347A	3396	Screw	4	2JC-364A	3396	Screw	4

COLUMN TUBING PLAIN AND UNIVERSAL MACHINES



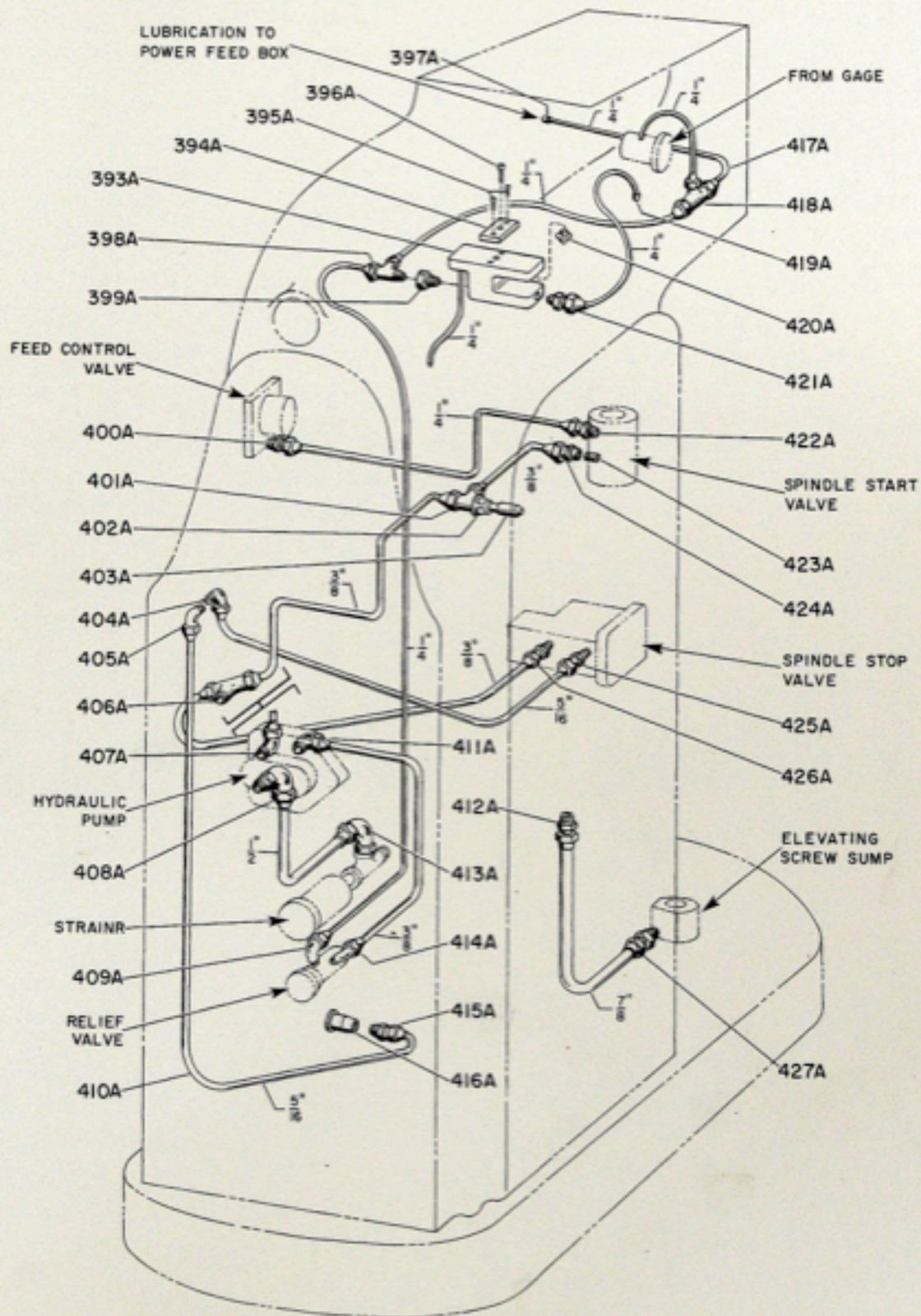
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued) PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-365A	2190	Bushing - Tubing	4	2JC-378A	162513	Tubing List (With Spindle Stop)	1
2JC-366A		Tubing List		2JC-379A	159052	Bushing - Adapter (With Spindle Stop) . . .	1
	149284	2MI, 2ML Machines	1	2JC-380A	57286	Fitting - Elbow	1
	157912	3MI Machines	1	2JC-381A	79730	Fitting - Tubing	1
2JC-367A	64509	Fitting - Tubing - Tee	1	2JC-382A	95018	Fitting - Elbow	1
2JC-368A	2190	Bushing - Tubing	1	2JC-383A	57286	Fitting - Elbow	1
2JC-369A	111784	Tube - Spray	1	2JC-384A	70382	Fitting - Tubing (With Spindle Stop)	1
2JC-370A	89866	Fitting - Tubing	1	2JC-385A	89866	Fitting - Tubing	1
2JC-371A	4023	Fitting - Tee	1	2JC-386A	14006	Nipple - Pipe	1
2JC-372A	4013	Fitting - Elbow (With Spindle Stop)	1	2JC-387A	69159	Fitting - Tubing	1
2JC-373A	4013	Fitting - Elbow (With Spindle Stop)	1	2JC-388A	111230	Fitting - Hydraulic	1
2JC-374A	68950	Fitting - Tee (With Spindle Stop)	1	2JC-389A	66143	Coupling - Reducing	1
2JC-375A	57286	Fitting - Elbow (Without Spindle Stop) . .	1	2JC-390A	57287	Fitting - Tubing (With Spindle Stop)	1
2JC-376A	95018	Fitting - Elbow	1	2JC-391A	70382	Fitting - Tubing (With Spindle Stop)	1
2JC-377A	58152	Fitting - Elbow	1	2JC-392A	79730	Fitting - Tubing	1

COLUMN TUBING VERTICAL MACHINES



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

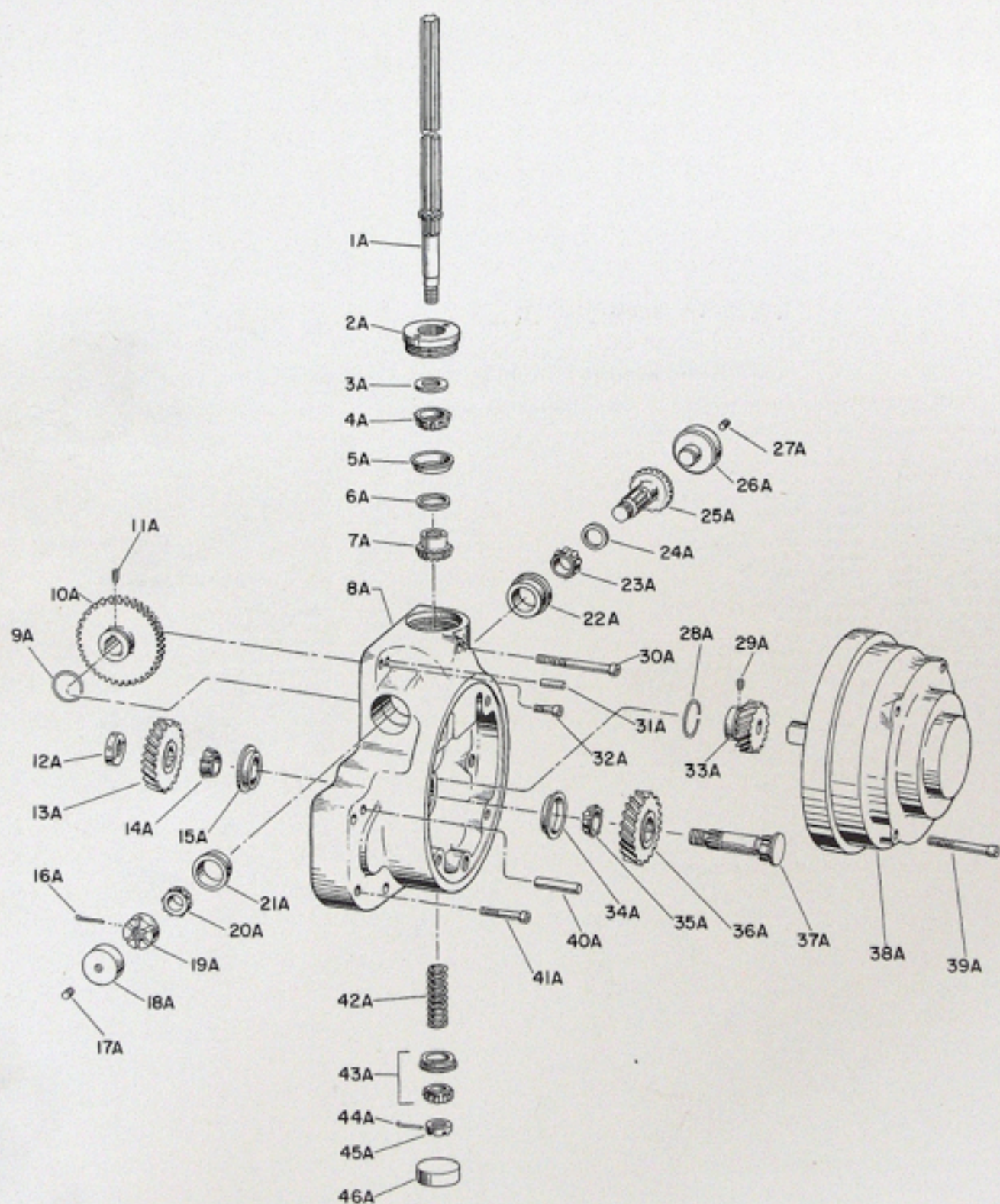
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Concluded)

2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JC-393A	120666	Body - Sprayer	1	2JC-411A	57286	Fitting - Elbow	1
2JC-394A	110441	Baffle - Spray Body	1	2JC-412A	79730	Fitting - Tubing	1
2JC-395A	3198	Screw	2	2JC-413A	95018	Fitting - Elbow	1
2JC-396A	3396	Screw	1	2JC-414A	57286	Fitting - Elbow	1
2JC-397A	2190	Bushing - Tubing	1	2JC-415A	70382	Fitting - Tubing (With Spindle Stop)	1
2JC-398A	61742	Fitting - Tee	1	2JC-416A	159052	Bushing - Adapter (With Spindle Stop)	1
2JC-399A	58197	Bushing - Reducing	1	2JC-417A	149263	Tubing List	1
2JC-400A	89866	Fitting - Tubing	1	2JC-418A	64509	Fitting - Tee	1
2JC-401A	4023	Fitting - Tee	1	2JC-419A	2190	Bushing - Tubing	1
2JC-402A	66143	Coupling - Reducing	1	2JC-420A	30223	Sprayer	1
2JC-403A	111230	Fitting - Hydraulic	1	2JC-421A	89866	Fitting - Tubing	1
2JC-404A	4013	Fitting - Elbow (With Spindle Stop)	1	2JC-422A	89866	Fitting - Tubing	1
2JC-405A	4013	Fitting - Elbow (With Spindle Stop)	1	2JC-423A	14006	Nipple - Pipe	1
2JC-406A	68950	Fitting - Tee (With Spindle Stop)	1	2JC-424A	69159	Fitting - Tubing	1
2JC-407A	57286	Fitting - Elbow (Without Spindle Stop)	1	2JC-425A	57287	Fitting - Tubing (With Spindle Stop)	1
2JC-408A	95018	Fitting - Elbow	1	2JC-426A	70382	Fitting - Tubing (With Spindle Stop)	1
2JC-409A	58152	Fitting - Elbow	1	2JC-427A	79730	Fitting - Tubing	1
2JC-410A	162513	Tubing List (With Spindle Stop)	1				

DRIVE FROM KNEE



284 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

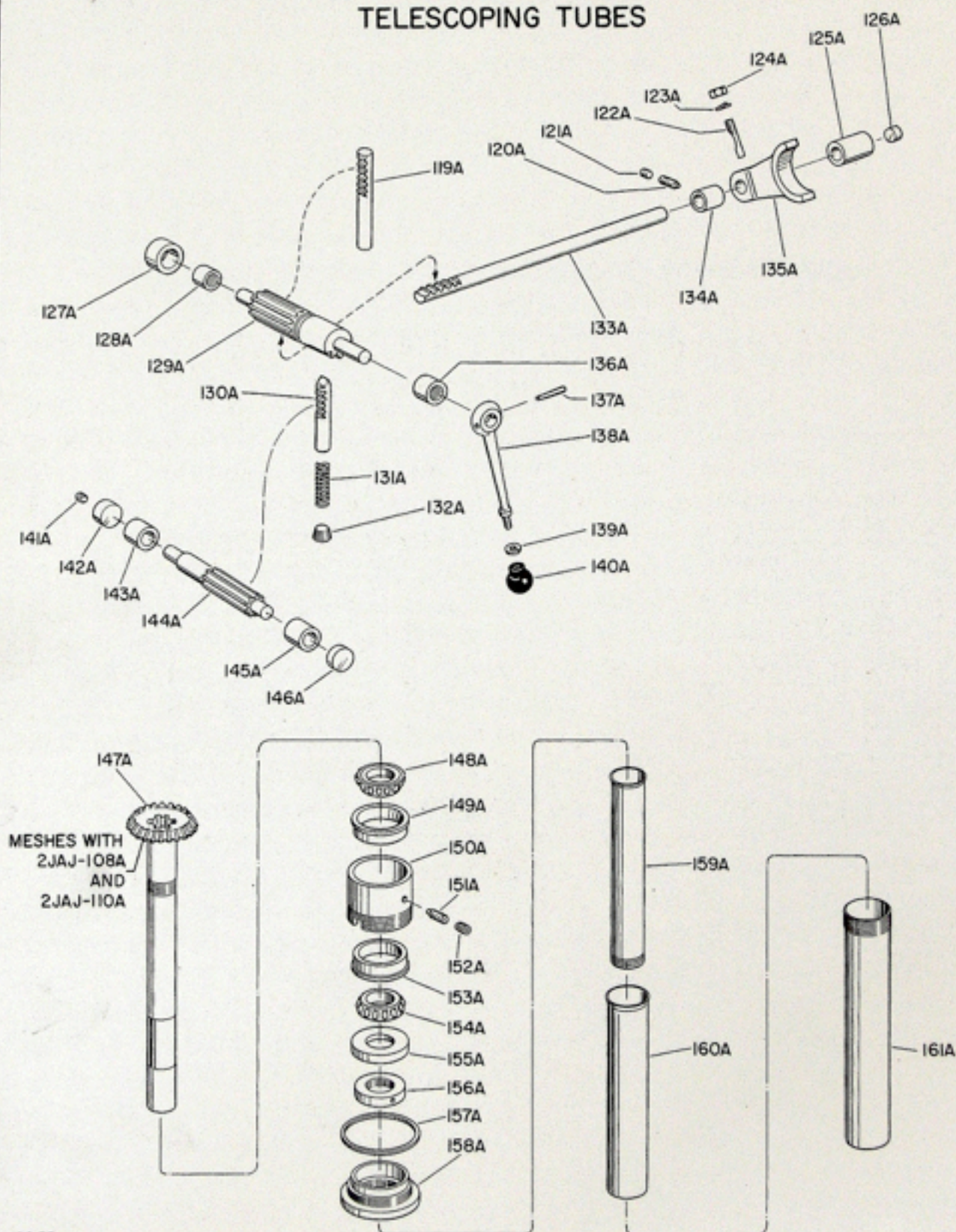
FEED TO VERTICAL HEAD — UNIT No. 2JAJ

2MI VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JAJ-1A	130503	Shaft - Vertical Spine	1	2JAJ-26A	118315	Plug	1
2JAJ-2A	118321	Cap.	1	2JAJ-27A	1911	Screw	1
2JAJ-3A	133125	Washer - Vertical Spine Shaft	1	2JAJ-28A	98166	Ring - Retainer	1
2JAJ-4A	95585	Cone - Bearing	1	2JAJ-29A	3232	Screw - Set	1
2JAJ-5A	95586	Cup - Bearing	1	2JAJ-30A	3216	Screw	3
2JAJ-6A	118349	Spacer - Bevel Pinion	1	2JAJ-31A	3369	Pin	1
2JAJ-7A	118322	Pinion - Spiral Bevel	1	2JAJ-32A	3266	Screw	1
2JAJ-8A	154938	Bracket - Motor Drive	1	2JAJ-33A		Pinion - Helical - Motor Shaft	
2JAJ-9A	30926	Ring - Spring	1		151613	1800 RPM Motor	1
2JAJ-10A	118314	Gear - Bevel Gear Drive Shaft	1		161949	1500 RPM Motor	1
2JAJ-11A	3228	Screw - Set	1	2JAJ-34A	108387	Cup - Bearing	1
2JAJ-12A	4241	Nut - Lock	1	2JAJ-35A	212905	Cone - Bearing	1
2JAJ-13A	154937	Gear - Helical Driver	1	2JAJ-36A		Gear - Helical - Driven	
2JAJ-14A	212905	Cone - Bearing	1		157249	1800 RPM Motor	1
2JAJ-15A	108387	Cup - Bearing	1		161930	1500 RPM Motor	1
2JAJ-16A	1959	Pin - Cotter	1	2JAJ-37A	157275	Shaft - Motor Drive Bracket	1
2JAJ-17A	1911	Screw	1	2JAJ-38A	Example*	Motor - Drive	1
2JAJ-18A	3852	Plug	1	2JAJ-39A	Example*	Screw - Motor	1
2JAJ-19A	111135	Nut	1	2JAJ-40A	3863	Pin	1
2JAJ-20A	78731	Cone - Bearing	1	2JAJ-41A	3402	Screw	3
2JAJ-21A	78732	Cup - Bearing	1	2JAJ-42A	227210	Spring - Compression	1
2JAJ-22A	212429	Cup - Bearing	1	2JAJ-43A	76225	Bearing - Roller	1
2JAJ-23A	212905	Cone - Bearing	1	2JAJ-44A	703	Pin - Cotter	1
2JAJ-24A	115308	Spacer	1	2JAJ-45A	96560	Nut - Round Slotted	1
2JAJ-25A	118323	Gear - Spiral Bevel	1	2JAJ-46A	3556	Plug	1

*State Serial Number of Machine when ordering this part.

SHIFTING LINKAGE TELESCOPING TUBES



196 RR
197 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

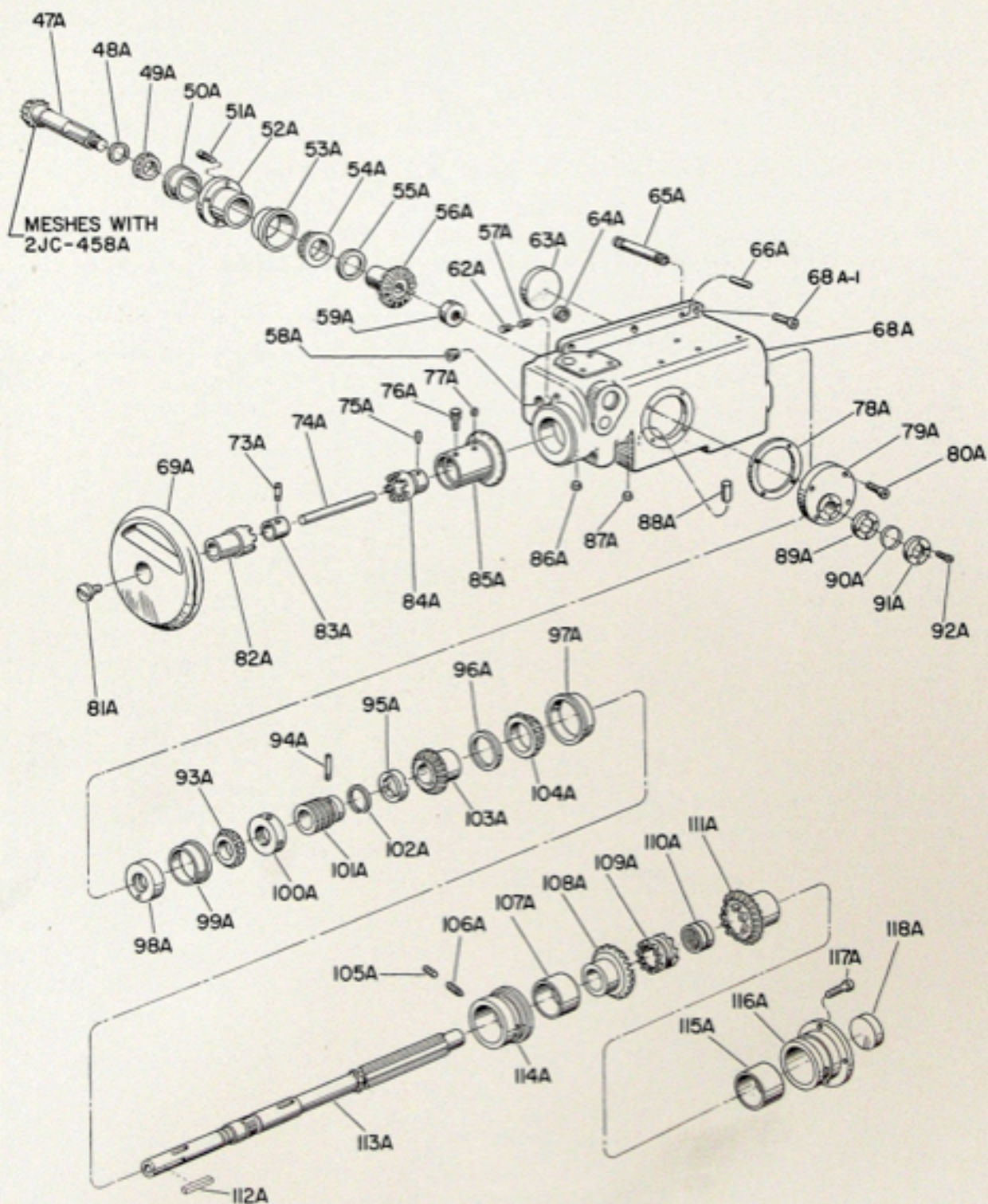
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

FEED TO VERTICAL HEAD — UNIT No. 2JAJ (Continued)

2MI VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JAJ-47A	120603	Gear - Bevel Drive to Feed Screw	1	2JAJ-86A	76644	Plug	1
2JAJ-48A	115308	Washer - Fitting	1	2JAJ-87A	220784	Plug	1
2JAJ-49A	90367	Cone - Bearing	1	2JAJ-88A	116047	Tube - Oil Level	1
2JAJ-50A	108004	Cup - Bearing	1	2JAJ-89A	4077	Gasket - Oil Gage	1
2JAJ-51A	3218	Screw	4	2JAJ-90A	4078	Disc - Oil Gage	1
2JAJ-52A	120608	Sleeve - Bearing	1	2JAJ-91A	4076	Cover - Oil Gage	1
2JAJ-53A	95586	Cup - Bearing	1	2JAJ-92A	3198	Screw	4
2JAJ-54A	95585	Cone - Bearing	1	2JAJ-93A	98795	Cone - Bearing	1
2JAJ-55A	118349	Spacer - Bevel Pinion	1	2JAJ-94A	100827	Pin	1
2JAJ-56A	125967	Gear - Drive Shaft Bevel	1	2JAJ-95A	115270	Collar - Lock	1
2JAJ-57A	3234	Screw - Set	1	2JAJ-96A	120658	Spacer - Fitting	1
2JAJ-58A	220784	Plug - Pipe	1	2JAJ-97A	108271	Cup - Bearing	1
2JAJ-59A	4184	Nut - Lock	1	2JAJ-98A	115267	Plug - Oil Retainer	1
2JAJ-62A	1911	Screw - Set	1	2JAJ-99A	212429	Cup - Bearing	1
2JAJ-63A	3559	Plug	1	2JAJ-100A	4186	Nut - Lock	1
2JAJ-64A	103661	Ring - Seal	1	2JAJ-101A	116050	Sleeve - Rack	1
2JAJ-65A	115272	Tube - Drain	1	2JAJ-102A	30059	Ring - Snap	1
2JAJ-66A	1664	Pin - Straight	2	2JAJ-103A	115277	Gear - Bevel Driver	1
2JAJ-68A	125855	Bracket - Upper Power Feed	1	2JAJ-104A	69189	Cone - Bearing	1
2JAJ-68A-1	3399	Screw	5	2JAJ-105A	78600	Screw - Set	1
2JAJ-69A	120619	Handwheel	1	2JAJ-106A	3229	Screw - Set	1
2JAJ-73A	66254	Pin - Collar	1	2JAJ-107A	115274	Bushing - Retainer - Large	1
2JAJ-74A	115276	Rod - Knockout	1	2JAJ-108A	115263	Gear - Bevel	1
2JAJ-75A	103128	Screw - Set	1	2JAJ-109A	115284	Clutch - Reverse	1
2JAJ-76A	2253	Screw - Thumb	1	2JAJ-110A	237109	Bearing - Needle	1
2JAJ-77A	224107	Plug - Pipe	1	2JAJ-111A	115263	Gear - Bevel	1
2JAJ-78A	115296	Gasket - Oil Sight Cover	1	2JAJ-112A	3293	Key	1
2JAJ-79A	115295	Cover - Oil Sight	1	2JAJ-113A	115286	Shaft - Feed Drive	1
2JAJ-80A	3218	Screw	4	2JAJ-114A	118336	Bearing - Clutch Bevel Gear	1
2JAJ-81A	3514	Screw - Handwheel	1	2JAJ-115A	115274	Bushing - Retainer - Large	1
2JAJ-82A	115284	Clutch - Handwheel	1	2JAJ-116A	115280	Retainer - Reverse Gear	1
2JAJ-83A	66249	Collar - Small	1	2JAJ-117A	3218	Screw	4
2JAJ-84A	115285	Clutch - Dial	1	2JAJ-118A	209592	Plug	1
2JAJ-85A	115282	Dial - Handwheel Feed	1				

UPPER BRACKET



93 RR
196 RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

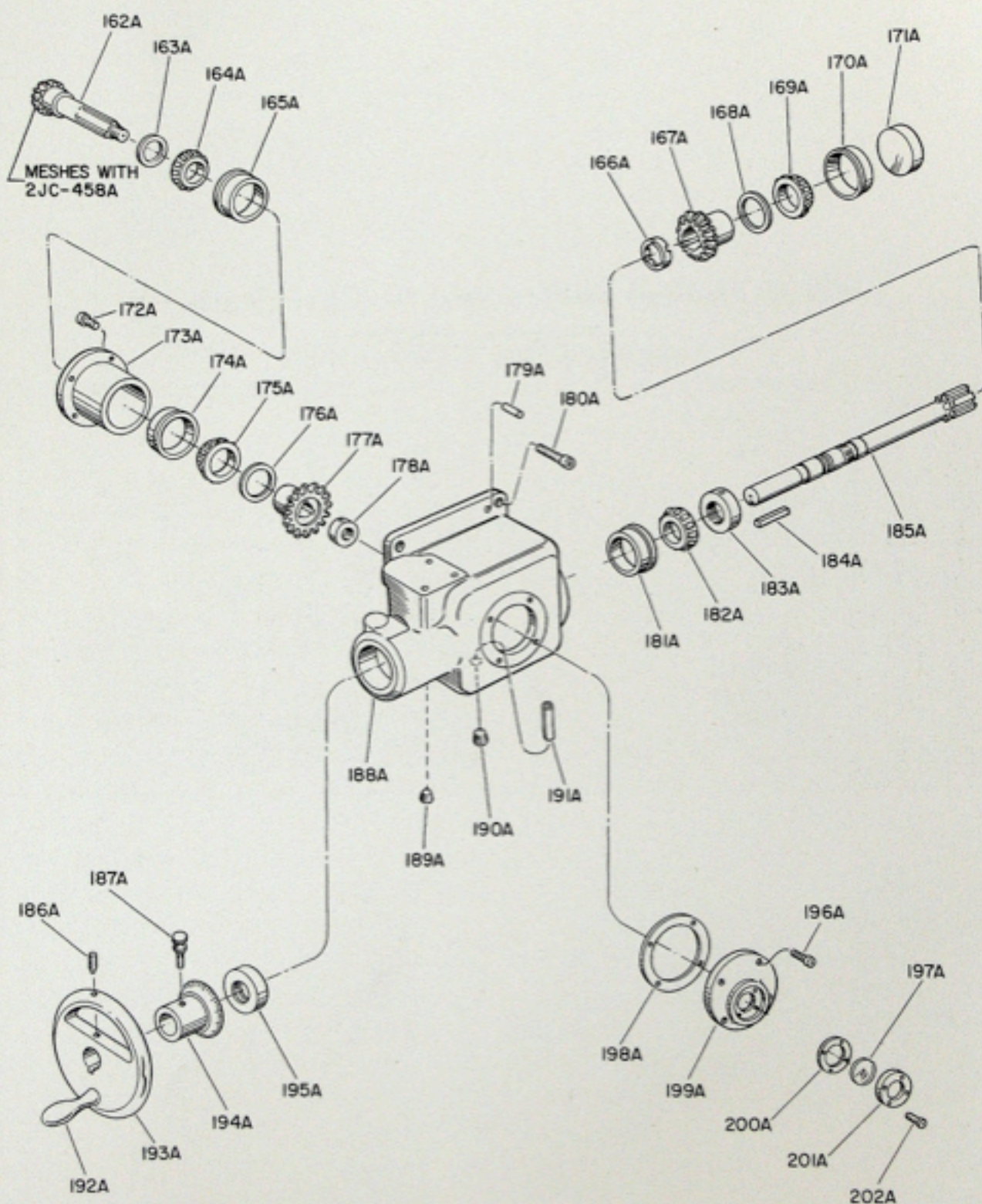
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

FEED TO VERTICAL HEAD — UNIT No. 2JAJ (Continued)

2MI VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JAJ-119A	116051	Back - Feed Trip	1	2JAJ-141A	2301	Screw	1
2JAJ-120A	3230	Screw - Set	1	2JAJ-142A	120612	Plug	1
2JAJ-121A	2333	Screw - Set	1	2JAJ-143A	125275	Bushing - Detent Plunger Pinion	1
2JAJ-122A	96507	Pin - Lock	1	2JAJ-144A	120407	Pinion - Detent Plunger	1
2JAJ-123A	2135	Washer - Lock	1	2JAJ-145A	125275	Bushing - Detent Plunger Pinion	1
2JAJ-124A	2144	Nut - Hex	1	2JAJ-146A	118337	Plug	1
2JAJ-125A	115287	Support - Clutch Shifter Rod	1	2JAJ-147A	120618	Gear - Sleeve Bevel	1
2JAJ-126A	3530	Plug	1	2JAJ-148A	95585	Cone - Bearing	1
2JAJ-127A	118338	Plug - Bearing	1	2JAJ-149A	95586	Cup - Bearing	1
2JAJ-128A	79525	Bearing - Needle	1	2JAJ-150A	120611	Sleeve - Adjusting	1
2JAJ-129A	128618	Pinion - Clutch Shifter	1	2JAJ-151A	3233	Screw	1
2JAJ-130A	128617	Plunger - Detent	1	2JAJ-152A	1911	Screw	1
2JAJ-131A	213270	Spring - Compression	1	2JAJ-153A	95586	Cup - Bearing	1
2JAJ-132A	220784	Plug - Pipe	1	2JAJ-154A	95585	Cone - Bearing	1
2JAJ-133A	116053	Rod - Clutch Shifter	1	2JAJ-155A	118348	Slinger - Oil	1
2JAJ-134A	3598	Bushing	1	2JAJ-156A	118341	Nut - Lock	1
2JAJ-135A	118340	Fork - Clutch Shifter	1	2JAJ-157A	120613	Gasket - Threaded Bushing	1
2JAJ-136A	219348	Bearing - Needle	1	2JAJ-158A	120600	Bushing - Threaded Slider	1
2JAJ-137A	642	Pin - Taper	1	2JAJ-159A	118320	Tube - Lower Telescopic	1
2JAJ-138A	112967	Handle	1	2JAJ-160A	118319	Tube - Middle Telescopic	1
2JAJ-139A	2135	Washer - Lock	1	2JAJ-161A	130501	Tube - Upper Telescopic	1
2JAJ-140A	115032	Ball - Handle	1				

HAND FEED BRACKET



200RR

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

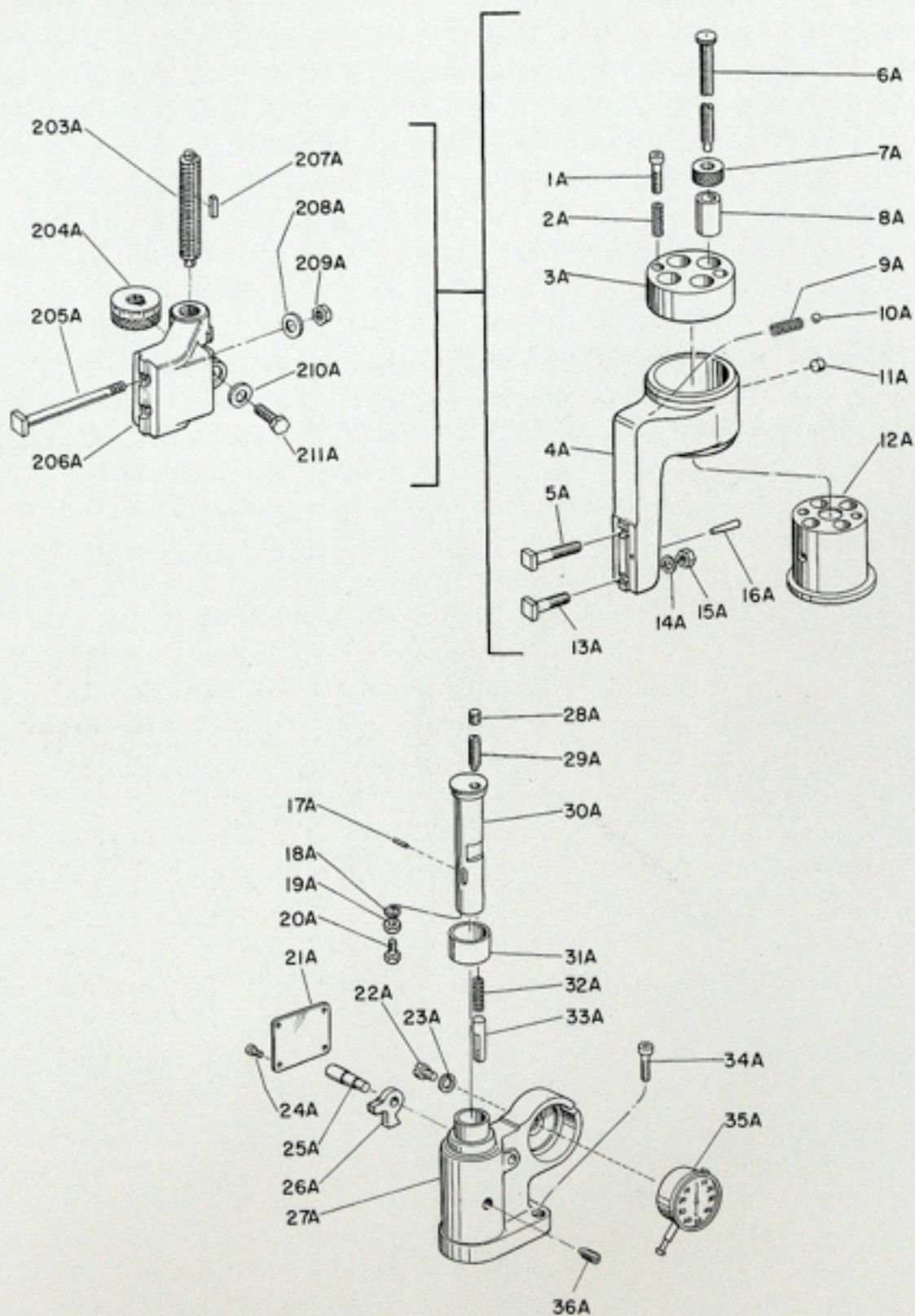
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

FEED TO VERTICAL HEAD—UNIT No. 2JAJ (Concluded)

2MI VERTICAL MACHINES WITHOUT POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JAJ-162A	120603	Gear - Bevel Drive to Feed Screw	1	2JAJ-163A	4186	Nut - Lock	1
2JAJ-163A	115308	Washer - Fitting	1	2JAJ-164A	1632	Key	1
2JAJ-164A	90367	Cone - Bearing	1	2JAJ-165A	115318	Shaft - Vertical Head Hand Feed	1
2JAJ-165A	106004	Cup - Bearing	1	2JAJ-166A	3230	Screw - Set	1
2JAJ-166A	115270	Collar - Lock	1	2JAJ-167A	2255	Screw - Thumb	1
2JAJ-167A	115277	Gear - Bevel Driver	1	2JAJ-168A	125834	Bracket - Hand Feed	1
2JAJ-168A	120658	Spacer - Fitting	1	2JAJ-169A	76644	Plug - Pipe	1
2JAJ-169A	69189	Cone - Bearing	1	2JAJ-190A	220784	Plug - Pipe	1
2JAJ-170A	108271	Cup - Bearing	1	2JAJ-191A	116047	Pipe - Oil Level	1
2JAJ-171A	118335	Plug	1	2JAJ-192A	3501	Handle - Handwheel	1
2JAJ-172A	3218	Screw	4	2JAJ-193A	120620	Handwheel	1
2JAJ-173A	120608	Sleeve - Bearing	1	2JAJ-194A	115323	Dial - Hand Feed	1
2JAJ-174A	95585	Cup - Bearing	1	2JAJ-195A	115297	Plug - Oil Retainer	1
2JAJ-175A	95585	Cone - Bearing	1	2JAJ-196A	3218	Screw	4
2JAJ-176A	118349	Spacer - Bevel Pinion	1	2JAJ-197A	4078	Disc - Oil Gage	1
2JAJ-177A	125967	Gear - Drive Shaft Bevel	1	2JAJ-198A	115296	Gasket - Oil Sight Cover	1
2JAJ-178A	4184	Nut - Lock	1	2JAJ-199A	115295	Cover - Oil Sight	1
2JAJ-179A	1664	Pin	1	2JAJ-200A	4077	Gasket - Oil Gage	1
2JAJ-180A	3399	Screw	4	2JAJ-201A	4076	Cover - Oil Gage	1
2JAJ-181A	212429	Cup - Bearing	1	2JAJ-202A	3198	Screw	4
2JAJ-182A	98795	Cone - Bearing	1				

TURRET AND MICROMETER STOPS



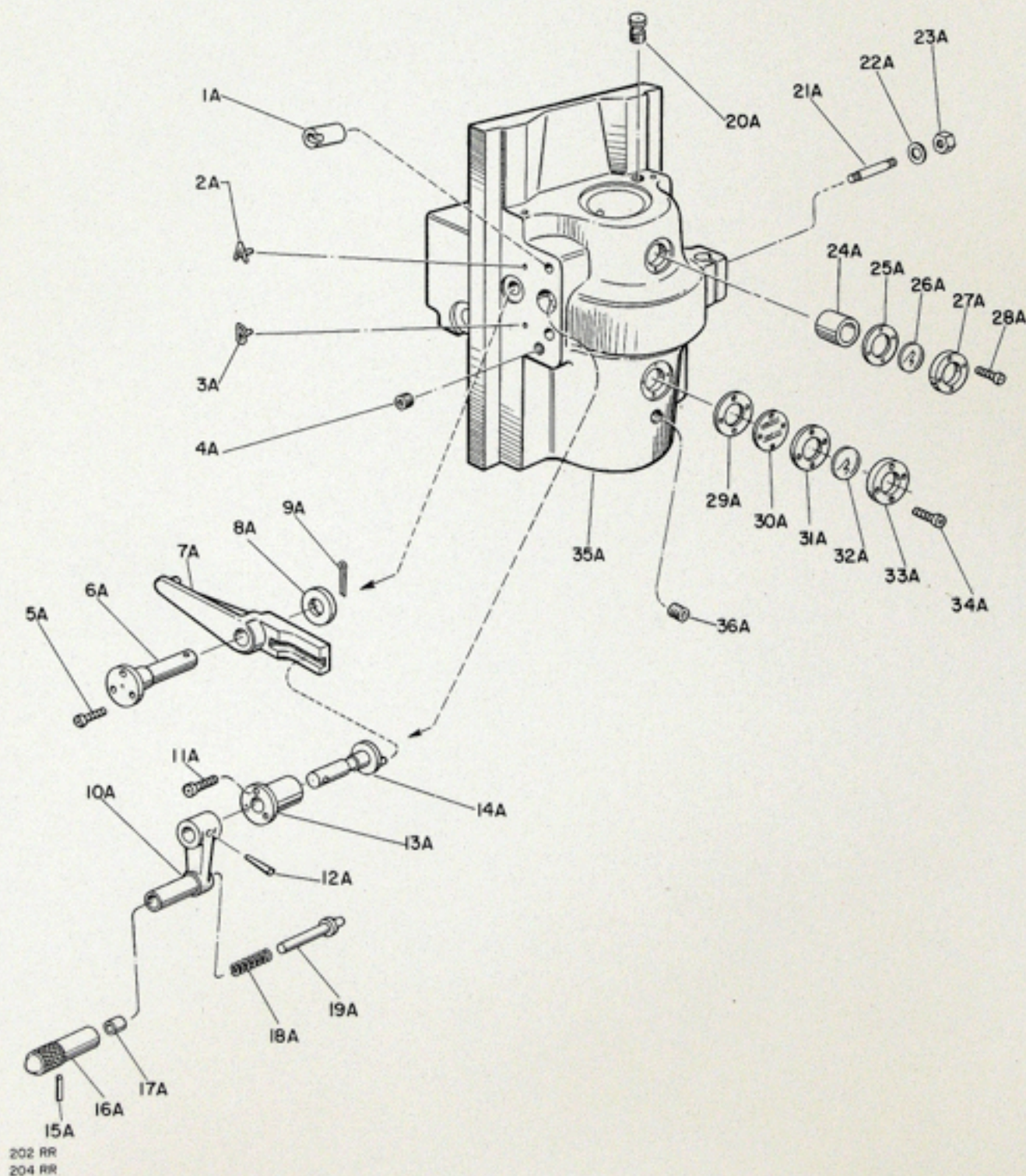
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

TURRET STOP — UNIT No. 2JAR 2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JAR-1A	3288	Screw	2	2JAR-25A	70317	Lever - Indicator Operating	1
2JAR-2A	70321	Spring - Compression	2	2JAR-27A	125803	Housing - Indicator	1
2JAR-3A	70312	Housing - Stop	1	2JAR-28A	1205	Screw	1
2JAR-4A	125804	Housing - Turret	1	2JAR-29A	1709	Screw	1
2JAR-5A	216690	Bolt - Tee	1	2JAR-30A		Plunger	
2JAR-6A	125802	Screw - Stop Adjusting	4		79294	With Power Feed	1
2JAR-7A	70320	Nut - Adjusting Screw Lock	4		104572	With Hand Feed	1
2JAR-8A	70319	Spacer	4	2JAR-31A	70316	Cover - Plunger	1
2JAR-9A	3942	Spring - Compression	1	2JAR-32A	283	Spring	1
2JAR-10A	30154	Ball - Steel	1	2JAR-33A	70315	Pin - Plunger	1
2JAR-11A	2259	Plug	1	2JAR-34A	3266	Screw	3
2JAR-12A	70311	Turret	1	2JAR-35A	143155	Indicator - Dial	1
2JAR-13A	200159	Bolt - Tee	1	2JAR-36A	3233	Screw - Set	1
2JAR-14A	3441	Washer	2	2FAJ-203A	37427	Screw - Adjusting (With Hand Feed Only)	1
2JAR-15A	3478	Nut - Hex	2	2FAJ-204A	37430	Dial - Head Adjusting (With Hand Feed Only)	1
2JAR-16A	645	Pin - Taper	1				
2JAR-17A	3383	Pin (With Hand Feed Only)	1	2FAJ-205A	118339	Bolt - Tee (With Hand Feed Only)	2
2JAR-18A	2123	Washer - Lock (With Power Feed Only)	1	2FAJ-206A	120617	Bracket - Micrometer (With Hand Feed Only)	1
2JAR-19A	3472	Nut - Hex (With Power Feed Only)	1				
2JAR-20A	216863	Screw - Adjusting (With Power Feed Only)	1	2FAJ-207A	342	Key (With Hand Feed Only)	1
2JAR-21A	128853	Cover - Indicator Housing	1	2FAJ-208A	3441	Washer - Plain (With Hand Feed Only)	2
2JAR-22A	68271	Screw	1	2FAJ-209A	664	Nut - Hex (With Hand Feed Only)	2
2JAR-23A	2135	Washer - Lock	1	2FAJ-210A	3441	Washer - Plain (With Hand Feed Only)	1
2JAR-24A	3198	Screw	4	2FAJ-211A	1062	Screw (With Hand Feed Only)	1
2JAR-25A	70318	Pin - Lever	1				

SHIFTER CONTROL AND OIL GAGES



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

VERTICAL HEAD — UNIT No. 2JDV 2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JDV-1A	95412	Stop - Change Feed Lever	2	2JDV-19A	115252	Plunger - Index	1
2JDV-2A	3334	Letter - "A"	1	2JDV-20A	85826	Plug - Oil Filler	1
2JDV-3A	3335	Letter - "B"	1	2JDV-21A	120626	Stud - Coolant Pipe Clamp	2
2JDV-4A	220784	Plug - Pipe	1	2JDV-22A	3441	Washer	2
2JDV-5A	3203	Screw	3	2JDV-23A	3478	Nut - Hex	2
2JDV-6A	120663	Shaft - Shifter Lever	1	2JDV-24A	120123	Body - Sight Oil Gage	1
2JDV-7A	115248	Lever - Gear Shifter	1	2JDV-25A	4077	Gasket - Oil Gage	1
2JDV-8A	1040	Washer	1	2JDV-26A	4078	Disc - Oil Gage	1
2JDV-9A	3496	Pin - Cotter	1	2JDV-27A	4076	Cover - Oil Gage	1
2JDV-10A	111251	Lever - Index	1	2JDV-28A	3197	Screw	4
2JDV-11A	3203	Screw	3	2JDV-29A	4077	Gasket - Oil Gage	1
2JDV-12A	143	Pin - Taper	1	2JDV-30A	96451	Dial - Oil Gage	1
2JDV-13A	120659	Bushing - Lever Shaft	1	2JDV-31A	4087	Gasket - Oil Gage	1
2JDV-14A	120660	Shaft - Index Lever	1	2JDV-32A	4078	Disc - Oil Gage	1
2JDV-15A	2291	Pin - Taper	1	2JDV-33A	4076	Cover - Oil Gage	1
2JDV-16A	112838	Handle - Speed Change	1	2JDV-34A	3197	Screw	4
2JDV-17A	106992	Bushing - Speed Change Lever	1	2JDV-35A	120661	Head - Vertical	1
2JDV-18A	253	Spring	1	2JDV-36A	76645	Plug - Pipe	1



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

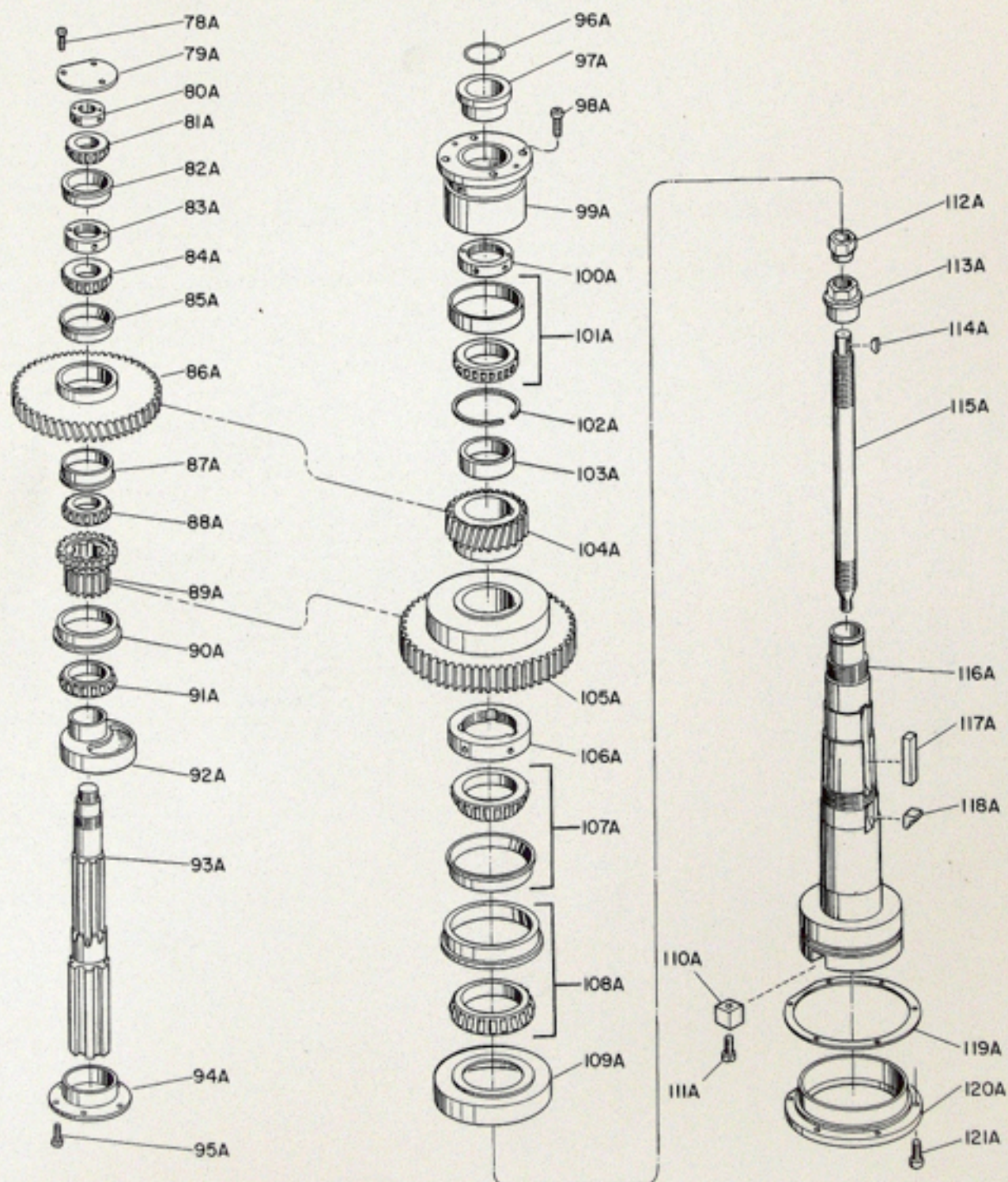
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

VERTICAL HEAD — UNIT No. 2JDV (Continued)

2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JDV-37A	51737	Oilier	2	2JDV-66A	4236	Plug - Pipe	1
2JDV-38A	4236	Plug - Pipe	2	2JAJ-67A	664	Nut - Hex	1
2JDV-39A	76644	Plug - Pipe	1	2JDV-68A	642	Pin - Taper	2
2JDV-40A	115377	Shod - CounterWeight	2	2JDV-69A	3486	Screw	2
2JDV-41A	120676	Plug - Oil Pipe	1	2JAJ-70A	12606	Dog - Lower Stop	1
2JDV-42A	120675	Tube - Oil Indicator	1	2JAJ-71A	3441	Washer	1
2JDV-43A	226182	Fitting - Tubing	1	2JAJ-72A	664	Nut - Hex	1
2JDV-44A	120674	Pipe - Oil Spray	1	2JDV-73A	115266	Guide - Vertical Head Stop	1
2JDV-45A	30154	Ball - Steel	4	2JAJ-74A	3314	Bolt - Tee	1
2JDV-46A	217267	Pin - Screw Clamp	1	2JDV-75A	3217	Screw	1
2JDV-47A	3204	Screw	6	2JDV-76A	3396	Screw	8
2JDV-48A	120662	Valve - Oil Pump	2	2JDV-77A	120643	Cover - Vertical Head	1
2JDV-49A	120664	Sleeve - Oil Pump	2	2JC-450A	133061	Nut - Slotted	1
2JDV-50A	115256	Spring - Oil Pump	2	2JC-451A	121159	Screw - Vertical Head Feed	1
2JDV-51A	115255	Plunger - Oil Pump	2	2JC-452A	1421	Pin - Straight	1
2JDV-52A	1844	Plug	5	2JC-453A	115363	Plug - Upper Column	1
2JDV-53A	115247	Rod - Gear Shifter	1	2JC-454A	2022	Pin - Cotter	1
2JDV-54A	3234	Screw - Set	1	2JC-455A	1421	Pin - Straight	1
2JDV-55A	115246	Shifter - Gear	1	2JC-456A	115357	Nut - Feed Screw	1
2JDV-56A	115258	Tube - Oil Catcher	1	2JC-457A	3307	Key	1
2JDV-57A	76645	Plug - Pipe	3	2JC-458A	115364	Gear - Bevel	1
2JDV-58A	4236	Plug - Pipe	1	2JC-459A	115366	Washer - Fitting	1
2JDV-59A	76644	Plug - Pipe	2	2JC-460A	108365	Cone - Bearing	1
2JAJ-60A	3441	Washer	1	2JC-461A	108366	Cup - Bearing	1
2JAJ-61A	120605	Dog - Upper Stop	1	2JC-462A	108366	Cup - Bearing	1
2JDV-62A	3227	Screw	6	2JC-463A	108365	Cone - Bearing	1
2JAJ-63A	3314	Bolt - Tee	2	2JC-464A	4192	Nut - Adjusting	1
2JDV-64A	76644	Plug - Pipe	2	2JC-465A	120681	Plug - Vertical Head	1
2JDV-65A	76644	Plug - Pipe	2				

VERTICAL SPINDLE AND BACK SHAFT



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

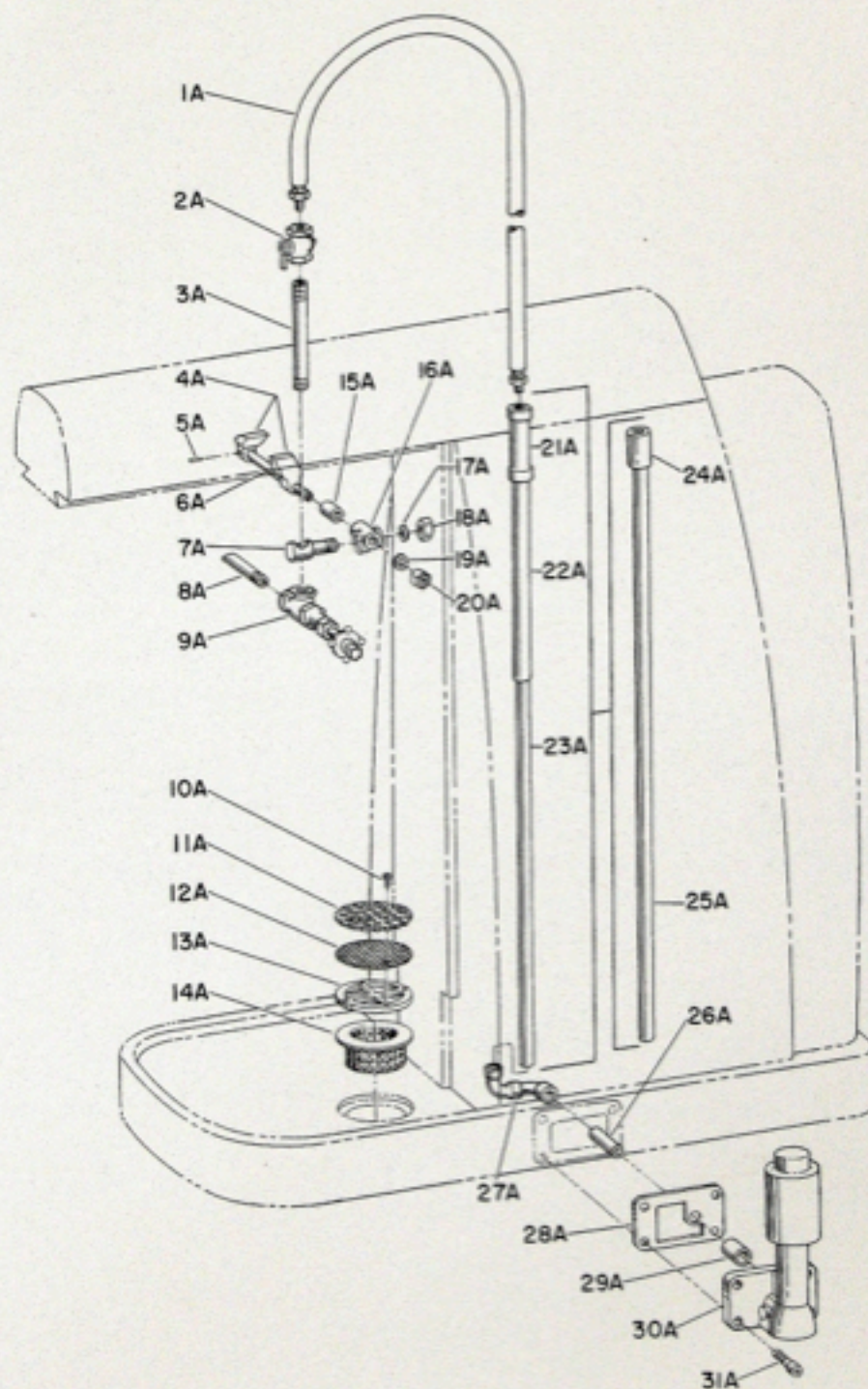
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

VERTICAL HEAD — UNIT No. 2JDV (Concluded)

2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JDV-78A	3203	Screw	3	2JDV-100A	225932	Nut - Lock	1
2JDV-79A	115260	Cover - Spine Shaft	1	2JDV-101A	115417	Bearing - Roller	1
2JDV-80A	4186	Nut - Lock	1	2JDV-102A	115418	Ring - Locking Spring	1
2JDV-81A	115240	Cone - Bearing	1	2JDV-103A	115232	Spacer - Spindle	1
2JDV-82A	99526	Cup - Bearing	1	2JDV-104A	115231	Gear - High Speed Helical Spindle	1
2JDV-83A	241257	Nut - Lock	1	2JDV-105A	120665	Gear - Low Speed Helical Spindle	1
2JDV-84A	115243	Cone - Bearing	1	2JDV-106A	3853	Nut - Lock	1
2JDV-85A	115244	Cup - Bearing	1	2JDV-107A	115225	Bearing - Roller	1
2JDV-86A	115242	Gear - Clutch	1	2JDV-108A	111048	Bearing - Roller	1
2JDV-87A	115244	Cup - Bearing	1	2JDV-109A	115227	Slinger - Oil - Spindle	1
2JDV-88A	115243	Cone - Bearing	1	2JDV-110A	3687	Key - Arbor Drive	2
2JDV-89A	115245	Gear - Clutch Sliding	1	2JDV-111A	1158	Screw	2
2JDV-90A	115237	Cup - Bearing	1	2JDV-112A	3639	Head - Draw Bolt	1
2JDV-91A	115236	Cone - Bearing	1	2JDV-113A	3641	Nut - Draw Bolt	1
2JDV-92A	134823	Eccentric - Pump	1	2JDV-114A	3280	Key - Woodruff	1
2JDV-93A	115235	Shaft - Spine	1	2JDV-115A	115389	Bolt - Draw	1
2JDV-94A	115239	Retainer - Oil	1	2JDV-116A	115224	Spindle - Vertical	1
2JDV-95A	3204	Screw	6	2JDV-117A	3436	Key - Square	1
2JDV-96A	74414	Ring - Locking Spring	1	2JDV-118A	4004	Key - Bearing Lock	1
2JDV-97A	115234	Cap - Spindle	1	2JDV-119A	115229	Gasket - Retainer	1
2JDV-98A	3396	Screw	4	2JDV-120A	115228	Retainer - Oil	1
2JDV-99A	115233	Retainer - Bearing	1	2JDV-121A	3396	Screw	6

COOLANT SUPPLY PLAIN AND UNIVERSAL MACHINES



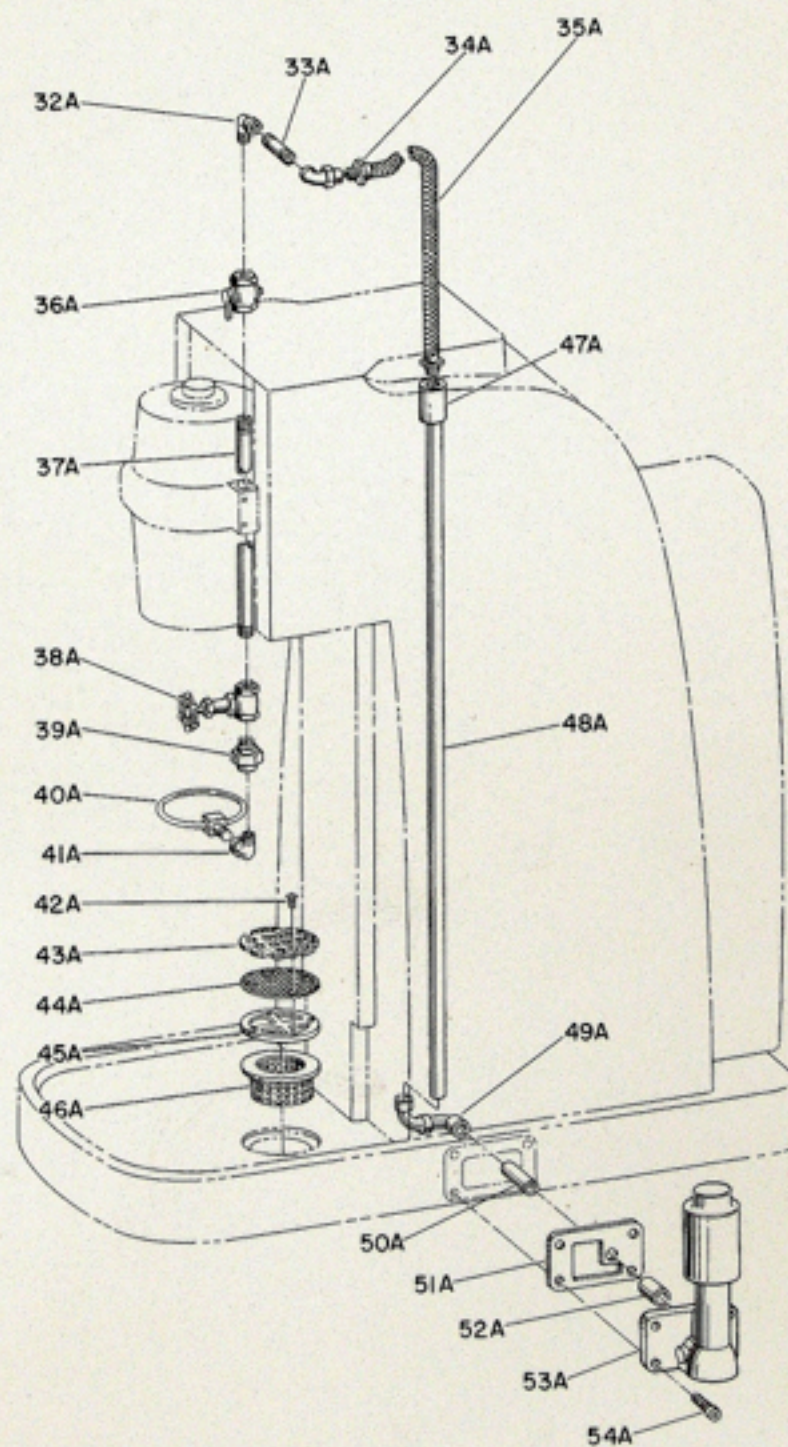
CINCINNATI NOS. 2-ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COOLANT — UNIT No. 2JP PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JP-1A	133058	Hose - Coolant	1	2JP-20A	3480	Nut - Hex	1
2JP-2A	103779	Valve - Stop	1	2JP-21A	149239	Coupling (2MI, 2ML Machines Only)	1
2JP-3A	108190	Pipe - Supply Valve	1	2JP-22A	149237	Tube - Splash (2MI, 2ML Machines Only) .	1
2JP-4A	100083	Clamp - On Overarm	2	2JP-23A		Pipe - Coolant	
2JP-5A	663	Pin - Taper	1		149234	2MI Machines	1
2JP-6A	112818	Stud - Overarm Clamp	1		149235	2ML Machines	1
2JP-7A	110221	Holder - Supply Pipe	1	2JP-24A	108192	Coupling - Supply Pipe (3MI Machines Only)	1
2JP-8A	111209	Nozzle - Coolant Supply	1	2JP-25A	157909	Pipe - Coolant (3MI Machines Only)	1
2JP-9A	108194	Valve - Angle	1	2JP-26A		Pipe - Coolant Supply	1
2JP-10A	3198	Screw	4		149240	2MI, 2ML Machines	1
2JP-11A	95673	Screen - Coarse Mesh	1		157917	3MI Machines	1
2JP-12A	95672	Screen - Fine Mesh	1	2JP-27A	149233	Assembly - Coolant Elbow	1
2JP-13A	95671	Frame - Strainer	1	2JP-28A	144104	Gasket - Pump	1
2JP-14A	124538	Strainer - In Column	1	2JP-29A	144103	Bushing - Coolant Supply	1
2JP-15A	108188	Spacer - Clamp Stud	1	2JN-30A		Pump - Coolant	
2JP-16A	100620	Clamp - Supply Pipe Holder	1		153999	Fairbanks - Morse	1
2JP-17A	1040	Washer	1		158429	Pioneer	1
2JP-18A	3480	Nut - Hex	1	2JN-31A	3343	Screw	4
2JP-19A	1040	Washer	1				

COOLANT SUPPLY 2MI VERTICAL MACHINES



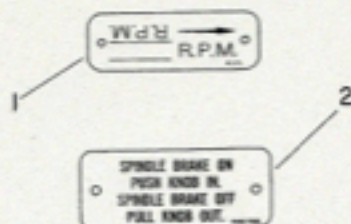
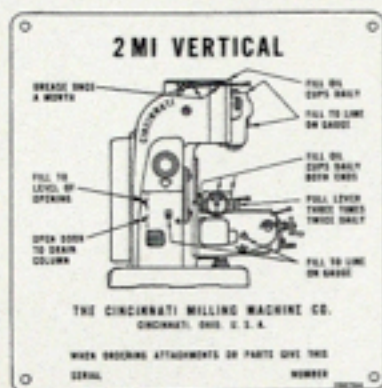
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

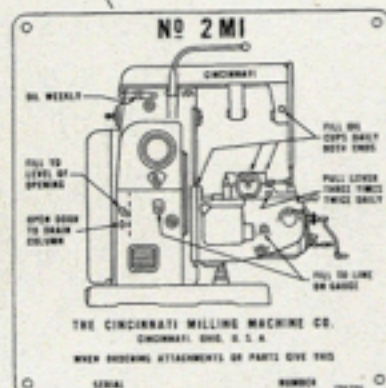
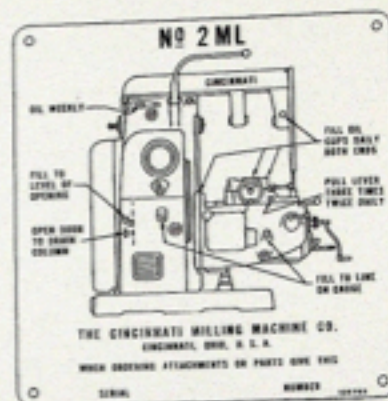
COOLANT—UNIT No. 2JP (Concluded) 2MI VERTICAL MACHINES

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
2JP-32A	38853	Elbow - Street	1	2JP-44A	95672	Screen - Fine Mesh	1
2JP-33A	29137	Nipple - Pipe	1	2JP-45A	95671	Frame - Strainer	1
2JP-34A	50935	Fitting	1	2JP-46A	124538	Strainer - In Column	1
2JP-35A	228295	Hose - Flexible	1	2JP-47A	108192	Coupling - Supply Pipe	1
2JP-36A	103779	Valve - Stop	1	2JP-48A	149238	Pipe - Coolant	1
2JP-37A	129822	Pipe - Coolant Supply	1	2JP-49A	149233	Assembly - Coolant Elbow	1
2JP-38A	120650	Valve - Globe	1	2JP-50A	149240	Pipe - Coolant Supply	1
2JP-39A	90588	Union - Pipe	1	2JP-51A	144104	Gasket - Pump	1
2JP-40A		Spray - Coolant		2JP-52A	144103	Bushing - Coolant Supply	1
	120632	Small	1	2JN-53A		Pump - Coolant	
	120649	Large	1		153999	Fairbanks - Morse	1
2JP-41A	38853	Elbow - Street	1		156429	Pioneer	1
2JP-42A	3198	Screw	4	2JN-54A	3343	Screw	4
2JP-43A	95673	Screen - Coarse Mesh	1				

INSTRUCTION PLATES



COLUMN PUMP PRESSURE
TO BE SET AT
280 LBS.
WITH OIL WARM



5

6

CLUTCH ADJUSTMENT

IMPORTANT: IF CLUTCH DOES NOT PULL, REPAIR OR REPLACE OUT OF ORDER. THE CLUTCH MUST BE ADJUSTED.

ADJUSTMENT: TO ADJUST CLUTCH, PULL HANDLING PIN OUT AND TURN ADJUSTING TOE TO RIGHT OR LEFT UNTIL CLUTCH SPRINGING LOOSE. REMOVE A FEW INCHES PRESSURE TO SPRING. A NEW CLUTCH SPRINGING SPRING ADJUSTMENT UNTIL TENSION SPRING AND WORN IN.

10

11

DANGER - KEEP DOOR CLOSED

ELECTRICAL CONTROL

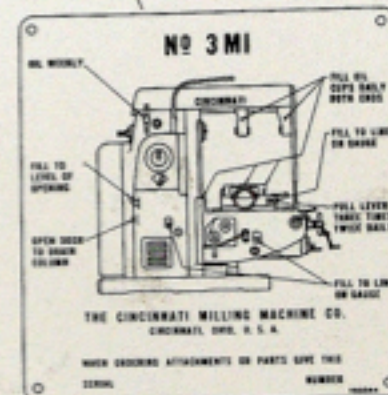
VOLTS POWER AC _____ PH _____ DC _____

VOLTS CONTROL _____ CY _____ FU _____

MACHINE SERIAL NO. _____

WIRING DIAGRAM NO. _____

THE CINCINNATI MILLING MACHINE CO.



9

WHEN USING "TURRET STOP",
DO NOT TRIP OUT
WITH QUICK TRAVERSE

LOOSEN HEAD CLAMP
BEFORE ENGAGING FEED

12

FEEDS FOR HEAD
ARE 0.5 OF THOSE
SHOWN ON FEED DIAL

13

PRESSURE SHOULD
BE SET AT 150 LBS.
WITH OIL WARM

14

CAUTION
DO NOT CHANGE
SPEEDS WHILE SPINDLE
IS ROTATING

15

UP MILLING
TURN KNOB OUT UNTIL TIGHT
DOWN MILLING
TURN KNOB IN UNTIL TIGHT

16

IN OUT

TABLE SCREW CLUTCH
IMPORTANT
LEVER MUST BE IN "OUT"
POSITION WHEN THE ATTACHMENT
IS DRIVEN BY AUXILIARY SHAFT
TO PREVENT CONFLICTING DRIVES.

CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

INSTRUCTION PLATES 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
1A	4315	Plate - Direction	1	10A	4318	Plate - Electrical Control.	1
2A	156756	Plate - Spindle Stop	1	11A	156768	Plate - Head Clamp Instruction (Vertical Machines)	1
3A	156766	Plate - Oiling (2MI Plain and Universal)	1	12A	156769	Plate - Head Feed (Vertical Machines)	1
4A	156764	Plate - Oiling (2MI Vertical)	1	13A	156773	Plate - Knee Pump Pressure Adjustment.	1
5A	156763	Plate - Clutch Adjustment.	1	14A	156771	Plate - Caution	1
6A	156772	Plate - Column Pump Pressure Adjustment.	1	15A	156761	Plate - Backlash Eliminator Control	1
7A	156844	Plate - Oiling (3MI Machines)	1	16A	156760	Plate - Table Screw Clutch (With Short Lead Attachment)	1
8A	156765	Plate - Oiling (2ML Machines)	1				
9A	156782	Plate - Turret Stop Instruction (Vertical Machines)	1				





MILLING MACHINES



DIE SINKING MACHINES



BROACHING MACHINES



CUTTER SHARPENING MACHINES



OPTICAL PROJECTION GRINDERS



FLAME HARDENING MACHINES



METAL FORMING MACHINES



CUTTING FLUIDS



PRECISION GRINDING WHEELS



Products of The Cincinnati Milling Machine Co. are listed and symbolized here. Products of their associate company, Cincinnati Grinders Incorporated, include a complete line of Centertype, Centerless, and Roll Grinding Machines.

* * *

The products of The Cincinnati Milling Machine Co. and of Cincinnati Grinders Incorporated are sold by Cincinnati Milling and Grinding Machines, Inc.

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.